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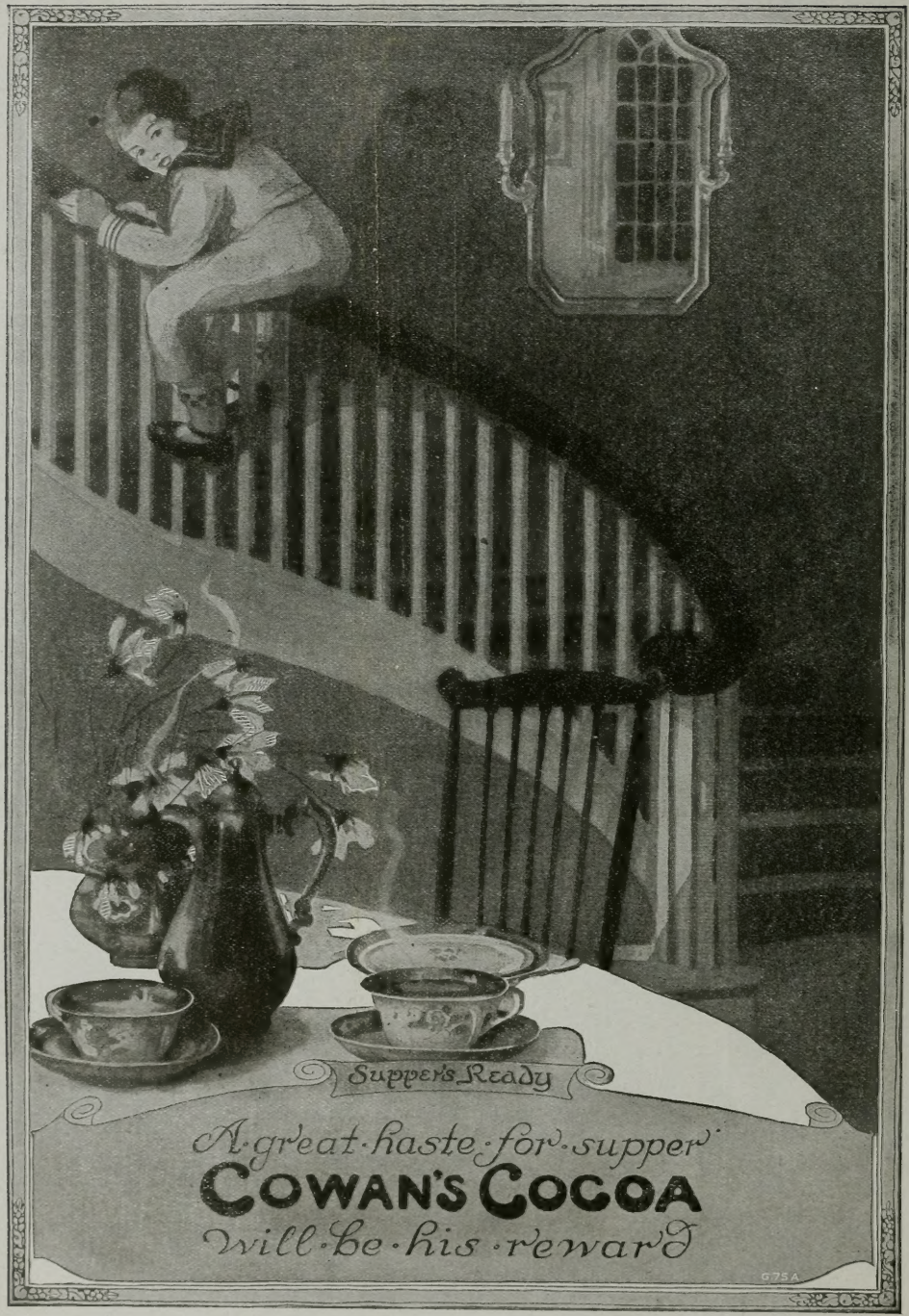
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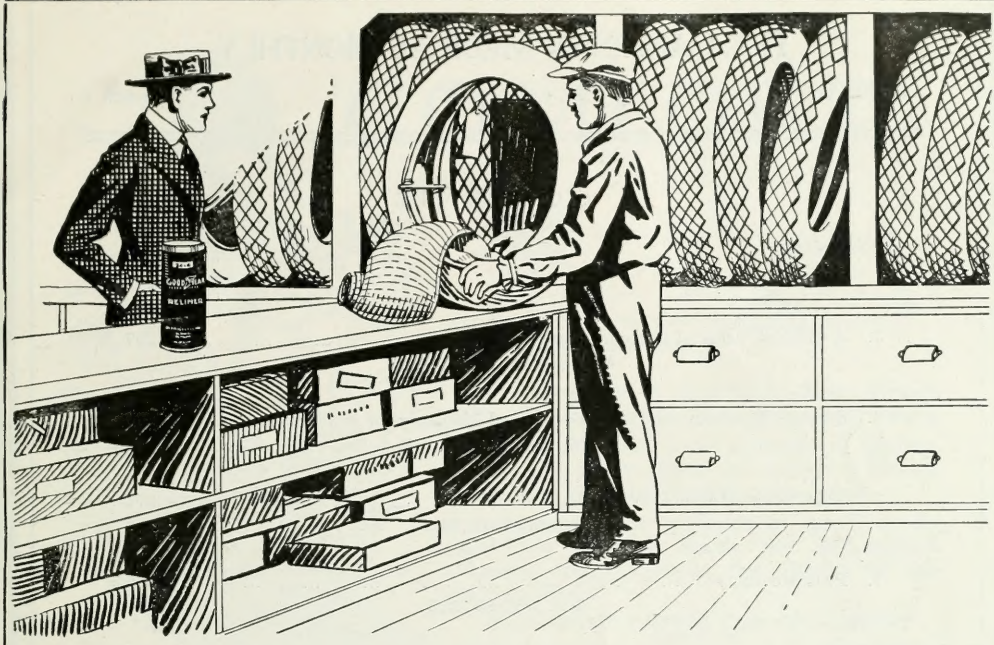

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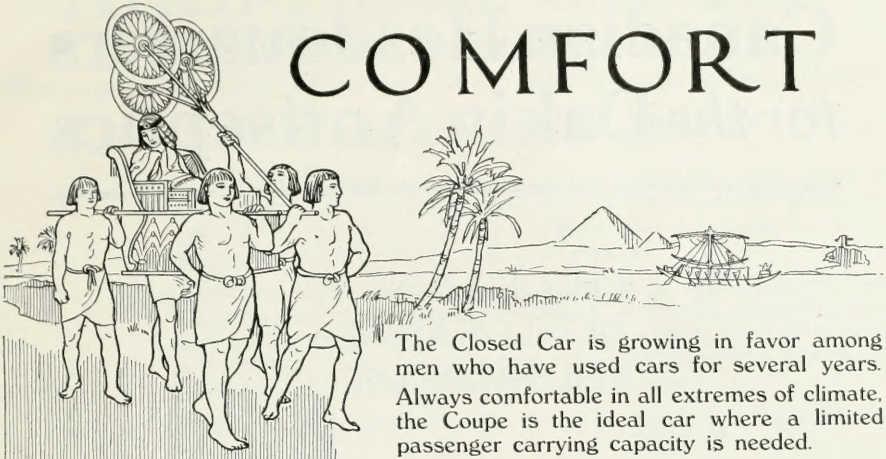

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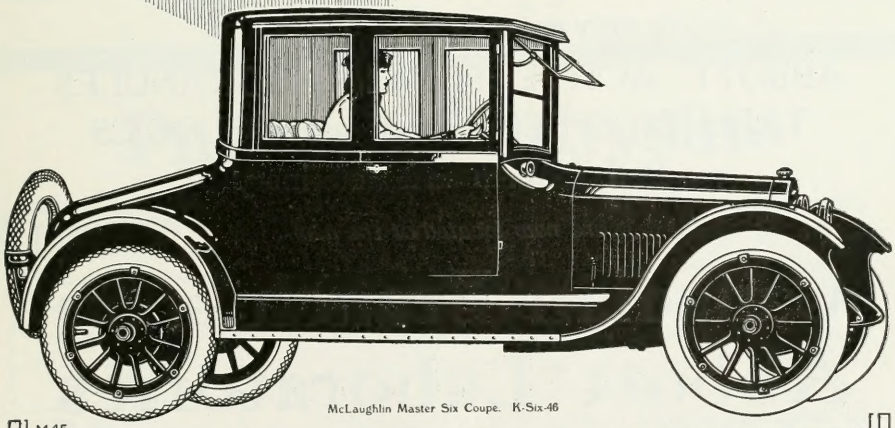

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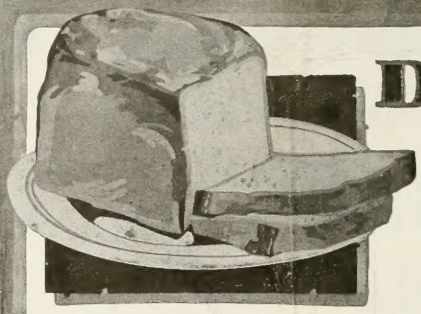

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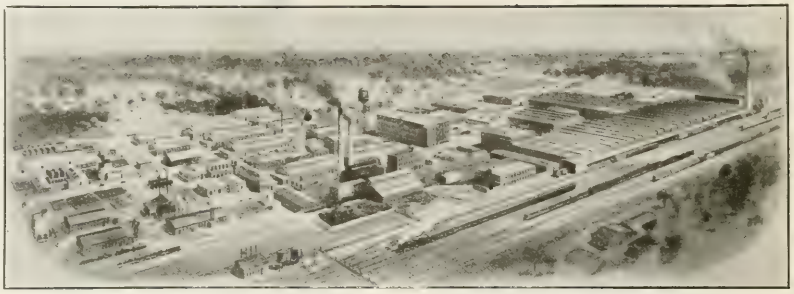

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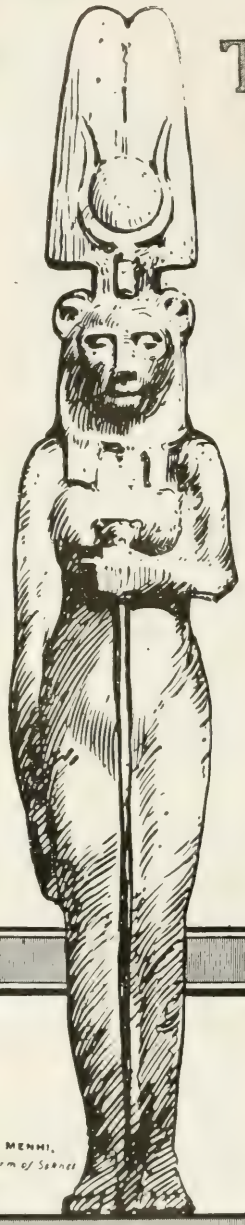

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The Canadian Medical Monthly

VOL. V., NO. 7 TORONTO, CANADA JULY, 1920

EDITORIAL

THE PROFESSION

The Ontario Medical Association, which has recently held its Fortieth Annual Meeting, is a gathering together of medical practitioners of the Province who meet to devise and discuss measures by which each and all medical men may ensure greater benefit to the general public.

It is true they enhance the value of their own knowledge and art by a comparison and interchange of ideas. The personal touch with fellow-practitioners means the comparison of practice and experience, the widening of each other's viewpoint, and the stimulation to advance and try out new measures that one's fellows have found of value. This, too, enables them to increase their income, if one must speak of shekels. This is, however, only a minor, if unfortunately a necessary part.

What has this to do with the public at large? Do the people of the Province realize that these doctors leave their practices and undertake the expense of coming to a distant point to learn how they can best serve their fellow-men? Do the citizens of this country comprehend how greatly they themselves must benefit by such meetings; how rapidly medicine and surgery are advancing; how new ideas are being introduced; how our conception of disease is being re-shaped, as is seen in the wonderful advance made in preventive medicine, truly the product of this age.

Without such meetings the discussion of great health problems would not occur, nor would the profession be stimulated to more earnest work and study to elucidate the many and complex problems dealing with the every-day sick.

When this is realized by the general public, they, or some of them, will no longer consider medicine as a trade, but as an art only to be mastered by years of study and application, and practised by those for whom service has a greater and a more noble reward than the amassing of wealth.

In what profession or calling can we point out a greater friend to even those unborn than the family doctor? At all hours he is at the call of those in distress —a wise counsellor—he often is, not only in regulating the way we live, but in many of the domestic difficulties which fall in our way.

Let no one look with disdain on this good old man, whose wisdom is gained in the only way, by years of experience and even sacrifice. Too often the public say, "He is getting a bit old." True, many of us are, but the years that beget a balanced judgment from ripe experience, a mellowness of intellect, not carried away by passing fads or professional fashions, keen faculties to consider health problems with a maturer judgment, form the outstanding assets the people of Canada have in the good old family doctor. All homage to him, his place in the community is large and cannot be filled by youthful specialists or the brilliant, precocious phenomenon ever ready to discredit the respect due to grey hairs.

An association to improve the roadways of the country, to benefit the grade of pigs, or to discuss measures dealing with even our variations of freakish raiments, frequently meets with the studied courtesies and entertainments of our city fathers. But the doctors come and go—no notice is taken of them; they have no trade union and their votes are scattered.

Maybe it is the realization that the medical profession neither seeks nor desires such things, as they are craftsmen imbued with a profound sense of humility and guided by the words of the Great Healer, "Whatsoever ye do unto the least of these, ye do also unto me."

A CLINICAL STUDY OF CHRONIC NEPHRITIS

BEAUMONT S. CORNELL, M.B. (Tor.)

In charge of Nephritis Clinic, Department of Soldiers' Civil Re-Establishment, Toronto.

The nephritic soldiers seen at this clinic may be readily classified as (1) Patients who have had their first acute attack within a period of less than three years, and (2) patients in whom the nephritis has never become acute. They form valuable material for study not only because of their uniformity, but also because, in every case, accurate records of clinical progress are available from the time of onset of their earliest symptoms. It is desirable therefore to study the 100 cases chosen for this article, from a documentary as well as a clinical viewpoint.

Since this is a purely clinical study, and since the absence of deaths has robbed it at once of the advantage and the confusion of post-mortem examination, the word Nephritis will be used in a broad clinical sense to mean damaged renal epithelium, regardless of whether the pathologic process be inflammatory or degenerative.

Let it be stated here, that whatever be the cause or causes of damaged renal epithelium, nephritis as an established disease must more and more be regarded as one of altered metabolism if we are to understand its symptoms or treat it efficiently.

ETIOLOGY.

No light can be thrown on the age incidence since all were within the limits of military service and soldiers of all ages suffered equally from the disease. Family history was a possible factor in only three cases. Syphilis coexisted with nephritis in one case. In three, Scarlet fever was the immediate cause, and in one, a remote possible cause. Calculus seemed to be the provocative factor in two cases. In six the symptoms dated from definite injuries such as falling from a horse, being struck over the kidneys by flying debris, or having the back severely wrenched. In eight cases, the nephritis followed soon after infectious diseases such as colitis, pleurisy, influenza, trench fever, and gonorrhoea, or after suppurating wounds. In seventeen others, nephritis began shortly after infections, followed by exposure; and in such cases the exposure seemed to be the immediate casual factor. The largest group in which causes might be assigned were twenty-three cases in which a very definite history of

exposure, simply and solely, was recorded. It is very striking that cold was *not* the nature of the exposure in these cases, but rather conditions of increased humidity, especially actual soaking of the skin, a point to which reference will presently be made. In the balance of the cases, no causal factors could be found. Even from this summary it could not be gainsaid that living micro-organisms in the kidney tissues was the pathological condition at the outset of the disease.

SYMPTOMS.

The symptoms, signs and complications of chronic nephritis are for the most part definite and well recognized,—headache, lumbar pain, nycturia, daytime frequency, oedema, abnormalities of vision; the more toxic symptoms, nausea and vomiting; the less common complication, renal asthma; the rarer complaints, leg-twitching and offensive perspiration; and the remote but constant symptom, varying in degree in different cases, viz. weakness.

But it is necessary to note that *dyspnoea*, the symptom commonest to all nephritics, is considered by the writer to be in no way associated with the heart in the vast majority of cases of early chronic nephritis; and it is so important a clinical entity and so little recognized for its true significance, that special description will presently be made of it.

The accurate study of symptoms reveals very definite information when once the usual order of their appearance is recognized.

Headache was present in eighty-three cases, varying slightly in its location, and greatly in its degree of constancy. In seventy-three cases it was always frontal, or perhaps better, temporal. The patient almost invariably places his thumb over one temple and his fingers over the other and squeezes the frontal bone to demonstrate the position and tight, vice-like character of the pain. The stock expression used by them is,—"In behind the eyes." In four cases the headache was chiefly occipital. In four others it grew to be a universal, bursting headache of terrible intensity and each of these four were put to bed, suspected of impending uremia; all the four gave low Phenolsulphonephthalein tests, two excreting less than 10% in two hours.

Headache was much commoner in patients who had experienced acute attacks of nephritis than in those with whom the disease remained always chronic. In the latter patients, the only head symptom for months was dizziness and vague "dopey" sensations, and, as a rule it requires six or eight months from the onset of disease for a real *ache* to become established. The same delay in development was observed in the headaches of those recovered from acute attacks. Hence it may be said that headache of any kind in chronic nephritis is usually to be regarded as a later symptom and not an early one. Once recovered from an acute attack a patient may be free of it for months, and in those in whom nephritis develops gradually without acute symptoms, there is usually no headache at all for several months.

Headache is frequently associated with scalp tenderness especially in the fifth nerve area. The ache is made worse by prolonged use of the eye muscles of accommodation as in reading. The severe, universal, bursting headache is usually associated with nausea and vomiting.

The common frontal headache of chronic nephritis is not pulsating but constant, dull, vice-like and sickening. In any given case it never remains continuously but comes in spells, sometimes for periods of an hour at different times in the day, or sometimes for periods of days, separated by days of freedom. It is worse in humid weather, worse in those whose kidneys give low functional tests, worse the longer the nephritis goes untreated, and worst of all in threatening uremia. On the other hand it is the first symptom to ease and disappear, once the patient begins to respond to dietetic and eliminative treatment.

Lumbar pain, in different positions and degrees, is undoubtedly the symptom most complained of by those who have it. It is not as common to all nephritics as dyspnoea, but it is next most common, and much more troublesome. It may be bilateral or confined to one posterior lumbar area; it may progress to the flank or to the outer part of the anterior lumbar area or radiate to the thighs. Most often it is confined to the back and is bilateral, although frequently one side may ache the more severely. In many cases the pain is always on the same one side. In three chronic nephritics with one kidney removed the pain was entirely on the side of the remaining kidney, and the fact that in none of them was any pain ever present on the vacant side seems to argue against "Sympathetic" crossed pain.

The skin of the posterior lumbar areas is frequently hyperaesthetic and the back always tender on deep pressure.

Backache is a very early symptom. Many soldiers (no less than six in this series) were boarded out of the army with "Myalgia", and since diagnosed as nephritis, thus proving that lumbar pain was the earliest symptom and the only symptom at first.

In many patients it depends on bodily posture, being made worse by the use of the back muscles as in standing or stooping. It is worse in humid weather. Strangely enough, in many severe cases with low kidney function, it is only a moderate symptom. But it was present, in varying degrees of intensity, in ninety-one cases. It is very early in onset, present pretty constantly in untreated cases, and is one of the last symptoms to disappear, if it disappears at all, under treatment. After an acute attack it nearly always remains until late in the chronic stage, when, as has been stated, it may become less troublesome.

Lumbar pain is generally accepted to be a viscero-cutaneous reflex, and one gains the impression that it originates in the kidney capsule when the latter is tensed by congestion. Measures which promote elimination, especially

sweating, temporarily ease the symptom. Similar relief is gained by the use of diuretics which have a direct action on the kidney e.g. Oil of Juniper, although needless to say such drugs are mistaken treatment.

Nycturia—Of one hundred patients, sixty find it necessary to rise at night to urinate. This figure is based solely on the records of the first interview with each patient. Of the other 40, nearly all experienced nycturia at previous dates, often months ago; and it is safe to predict that all of the 40, if they live long enough, will again experience nycturia although of a different kind. Distinction must be drawn between the nocturnal frequency of early nephritis and the true nocturnal polyuria of the later chronic stage. True nocturnal polyuria, in which a greater volume of urine is voided during night hours than during the day-time, is a symptom of kidneys in which considerable damage has been accomplished; whereas nocturnal frequency may not mean increased volume of urine, but may depend on urgency induced by irritation of an inflamed bladder (at its orifices), or irritation of a normal bladder by hyperacid urine. For these reasons it is found that *rising at night*, a symptom loosely termed nycturia, is present in the early stages of nephritis, then usually absent for months or even years, only to re-appear later. The explanation is as follows:—A large percentage of cases of nephritis are early accompanied by pyelitis, which is either the result or cause of an accompanying cystitis, and the involvement of the lower urinary tract sets up an urgency from irritation. This early frequency is not a polyuria but a so-called pollakiuria, for only small quantities are passed each time. It is found that after the nephritis develops there is a great tendency for the inflammation in the lower tract to subside, and the urgency, as a natural result, disappears, giving the patient a long period of restful nights. But after sufficient damage has been done to the kidney, whether as the late result of an acute attack or as the ultimate result of a slowly progressing chronic nephritis, the true nocturnal polyuria commences, causing the patient once more to rise at night. Hence the nycturia of incipient nephritis and that of long standing nephritis have different significations; and it is an important point to enquire into the history in cases where the patient, at the time interviewed, has no nycturia.

A dose of alkaline drug at bed-time often prevents the nocturnal pollakiuria by rendering the urine non-irritating, but has no such effect on true nocturnal polyuria in which the desire to urinate comes from the distention of the bladder by a large volume of urine.

One theory commonly put forward to explain nocturnal polyuria is that during rest in the horizontal position a change occurs in the renal circulation. This is evidently not true, because three patients in this series with advanced nephritis, and employed for over a year as night watchmen, still have their polyuria at night while at work, and not while sleeping in the day-time. Like the normal daily variations in the temperature curve, nocturnal polyuria is

unchanged by a reversal of working hours and resting hours and depends on some diurnal rhythm of the human organism, which is not easily changed.

Day-time pollakiuria, commonest in the early part of the disease, can usually be accounted for by one or combinations of the following explanations:— (1). Inflammation in the lower urinary tract. (2). Hyperacid urine. (3). Hypersensitivity in nervous patients.

Abnormalities of Vision were complained of by five patients, one of whom was found to have chronic choroiditis resulting from a previous acute attack of nephritis. The eye-grounds of the other four were normal. They all complained definitely of failing vision, and of blurring when reading. While only five made much complaint of failing vision, a large proportion (nearly 50%) complained of scotomata. Clinically it is found that after exercise these patients describe colour changes in the light from an electric bulb. To some it became red, to others blue or green or variegated, and the delusion lasted as long as the dyspnoea lasted, a fact to be mentioned again under acidosis.

Oedema—No instance of marked oedema occurred in any of the one hundred cases. In about 30% of them mild swellings occurred, such as mild puffiness under the eyes or in the hands and feet; and when the feet puffed they were usually sore. It is said that after the oedema of the acute attack disappears, there is no more marked oedema until later when the heart permits passive congestion. The mild oedema of early chronic nephritis appears to have no relation to the heart. It is usually found in the mornings on rising and not after a day of exertion, and is evidently caused by a toxic increase of the permeability of the capillary endothelium. This statement is based on observation of four patients each of whom had, as the result of wounds, a deep contracted scar on one leg interfering with the efficiency of the circulation in that one leg; it was found that when these patients were feeling well and were free of toxic symptoms there was no oedema in either leg, but so soon as they developed toxic symptoms, as, for example, in humid weather, marked oedema occurred in the wounded leg. That this oedema was not caused by lowered atmospheric pressure was proven by barometric readings. On the other hand, so soon as they recovered from toxic symptoms the oedema disappeared quickly. The injured legs were actual barometers of the patients' clinical condition.

Nausea is common in toxic cases and occurs especially in the mornings, a great many patients being unable to eat breakfast. *Vomiting* is less common, but frequently accompanies severe frontal headaches, especially in nervous patients, while it almost invariably accompanies the extreme universal headache of impending uremia.

Renal asthma occurred in only one patient, a man of thirty-eight with B.P. 126-73, normal heart, no radial sclerosis, and no history of acute attack. His phenolsulphonephthalein test gave 50% in two hours and his Water Test was also fairly good. The attacks of asthma usually came on at night, and were

characterized by inability to take a breath of normal depth. Lobelia gave him relief in five minutes, although the attacks usually lasted over thirty minutes without the drug.

Twitching of the legs occurred as a constant symptom in three patients and was important only because it prevented sleep. In one it was the very earliest symptom of his disease. None of the three were neurotic, and the symptom may be attributed to irritation of nerve trunks by a congested kidney.

Foul perspiration was the complaint which drove one patient to seek advice. Elimination relieved the symptom promptly.

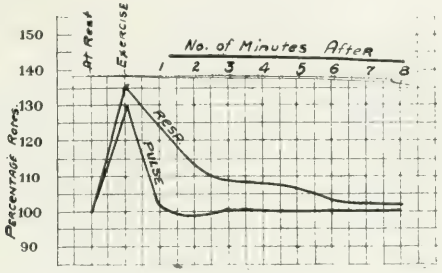
Dyspnoea—While this symptom is only occasionally volunteered by the patient as a complaint, yet the writer is in a position to make the somewhat sweeping assertion that dyspnoea is the most common symptom in chronic nephritis. It was present, on exertion, to a greater or less degree in 95% of the cases in this series. It is not ordinarily complained of, because, as a rule, it does not occasion the patient very great distress. It is a rapid, shallow, breathing (hyperpnoea), coming on after exercise, unaccompanied by cyanosis or distress, and continuing for some minutes; it cannot be a cardiac dyspnoea, because the heart in these cases gives no clinical evidence of disease and reacts as a normal heart does to exercise. Each of the hundred patients was given exercise and count kept of the respirations and pulse, until the respirations reached their rest rate. It was found that, whereas in a normal person, the respirations and pulse reach their rest rate within two minutes after the prescribed exercise, the respiratory rate in the nephritic required much longer, sometimes four minutes, usually five or six minutes and frequently ten. (The exercise consisted in touching the floor ten times rapidly with the knees unbent).

Little has been written about the dyspnoea of chronic nephritis, but the clinical fact is before the profession as a result of these findings; and it is an important fact, chiefly because it indicates, as the author believes, a degree of acidosis which one would not have been prepared to believe existed in chronic nephritis. That acidosis exists in acute cases, even to very toxic concentrations, has been recently demonstrated by Chase and Meyers. But it is interesting to note clinical evidence of acidosis in the chronic disease even before chemical analysis has been brought to prove the point.

It is conceded that the immediate cause of rapid breathing in all cases where it exists is an increased hydrogen ion concentration in the blood. This must, therefore, be the immediate cause of the dyspnoea observed in these cases. The excess of hydrogen ion may be presumed to result from the products of muscle exercise e.g. sarcolactic acid and carbonic acid. In the normal person the excess produced by exercise is soon excreted from the body. In the nephritic it is less slowly excreted and remains longer in the blood to stimulate the respiratory centre. Whether this tardiness of acid excretion is due directly to the

failure of a damaged kidney to function adequately, or due to changes in metabolism as a result of which the blood loses much of its power of neutralising acid bodies, are questions requiring investigation.

The accompanying chart shows graphically the average respiration and pulse response to exercise in one hundred cases:



Average Respiration—Pulse response to exercise in 100 cases of early chronic nephritis. The rates are calculated to percentages of rest rates, which are taken as 100.

Such a respiratory response is almost pathognomonic of nephritis. Much criticism will be levelled at the test; but it is undeniable that such a response, in the absence of any cardiac or pulmonary factor which might interfere, may be taken as a confirmatory test in diagnosis. A suitable name for it would be *Respiratory Index*.

While dyspnoea usually occurred only after exercise, it was present during rest in the four cases who developed uremia shortly afterwards, the rest rate reaching in one case, 50 per minute.

Whether the delusions of vision viz. the scotomata and colour changes of which many complained have any relation to the acidosis is uncertain, but seems probable because of the fact that is intensified during the dyspnoea after exercise and disappears when the dyspnoea disappears.

THE CLINICAL CONDITION.

It should be stated here that the author sees no sufficient reason to differentiate the nephritis of soldiers from that which occurs in civil life. But, most soldiers are in a better state of general health at the time of *getting* it, and this fact favours a more rapid recovery.

Generally speaking the chronic nephritic is lighter in weight than before acquiring the disease. The greatest loss occurs in those who have had greatest damage done to their kidneys by the acute attack, and in young men between

twenty-five and thirty-five this may be as much as fifty pounds. In older men especially those over forty, even though much kidney damage has been done, the loss in weight is less, being often about fifteen pounds. In very young men who contracted the disease during the growing period, as for example in two buglers who became nephritics at seventeen years and eighteen years of age respectively, it was found that the disease interfered very little with their growth as a result of which their weight three years later was much greater than at the onset of the disease, and in fact was not much less than their age and height would normally demand. (It should be noted that the loss of weight in men over twenty-five is fairly proportionate to the extent of kidney damage, as revealed by functional tests, and not necessarily proportionate to the severity of the symptoms of the acute attack, because it is found that the severity of the acute symptoms is not a reliable guide to the damage done the kidneys).

The *blood pressure* in chronic cases who have recovered from an acute attack usually remains low for months or even years; in fact it is nearly always too low for the age of the patient. The syndrome of high blood pressure and cardiac hypertrophy is something reserved for the future. It existed in only three cases of this series, two of whom gave low Kidney Function Tests, and the other only fair. There are four cases in whom cardiac hypertrophy exists without elevated blood pressure, and the progress of the hypertrophy has been carefully followed from its beginning. These three patients are similar in that they all give low Phenolsulphonephthalein Tests (under 30% in two hours), and each patient experiences sharp praecordial pain sometimes on exertion, but sometimes while resting in bed. In them, too, exists dyspnœa on exertion which differs from the dyspnœa of simple acidosis in that it is much more distressing and invariably volunteered as a complaint. While the blood pressure in these three is still within the limits of their age, it is definitely getting higher month by month; in one it is climbing at the rate of about 10 mm. per month and the patient suffers now from spells of nausea and vomiting. In the others an elevation of 20 points is noticed over a period of four months and they are still free from serious toxic symptoms. The point of all this is to show that cardiac hypertrophy precedes raised blood pressure: it is demonstrable and symptom producing before the blood pressure is higher than normal. There is reason therefore to believe—(1) That the hypertrophy is a response to circulating toxins and (2) That when hypertrophy commences in chronic nephritis it is associated with some dilatation. Perhaps no cardiac enlargement is demonstrable until hypertrophy begins, but it seems probable that slight dilatation even precedes hypertrophy thus accounting for the low blood pressure in the early chronic disease. The hypertension which develops later in the course may well be a protective phenomenon to maintain an adequate renal circulation.

Arteriosclerosis in varying degrees was present in only twelve cases. In six of these the blood pressure was always too low, viz. 104/98, 103/75, 104/75,

100/70, 115/80, 108/70, and in these cases the thickening of the arteries was slight. In them the similarity of the pulse pressure was striking, viz. 16, 28, 29, 30, 35, 38.

Of the other six, three were men over forty-five years of age, and it seems that age rather than disease was the more important factor. The three other cases were as follows:—(1) A young man of twenty-nine with a blood pressure of 204/140 and a low kidney function. (2) A young man of twenty-seven with a blood pressure of 134/79 and a low kidney function. (3) A man suffering from syphilis as well as nephritis in whom the thickening was confined to the left radial.

From the foregoing analysis, one can say that arteriosclerosis is not common in early chronic nephritis; and that it may begin before hypertension exists. It was absent in one very toxic case with impending uremia and blood pressure 230/130. But its absence is less definite data than its presence, since in all cases it must be remembered that a very limited number of arteries are available for clinical examination.

Many *associated diseases* are met with,—chronic appendicitis, chronic bronchitis, dysentery, neurasthenia, etc. Latent constitutional tendencies are provoked by nephritis, as they probably would be by any other serious disease e.g. toxic insanity. Glycosuria, transient and of no clinical importance, occurred in four cases, which is no greater a percentage than would be found in the general populace if their urine were continually being examined.

The Diagnosis of Nephritis ought not to be made, and in fact cannot be made, solely from finding albumin in the urine. First of all the re-action must be performed on a filtered specimen. If albumin is found, its source must be accurately determined. One must rule out urethritis, prostatis, cystitis, and if possible, pyelitis. The absence of pus cells is a fair indication of the absence of inflammation in the lower urinary tract, and strengthens the suspicion of a renal source of the albumin. Albumin of renal source means damaged kidney epithelium, and may signify mechanical inflammation from stone, degeneration from toxic causes, degeneration from pressure of new growths, degeneration from fibrous contraction, degeneration from such circulatory changes as passive congestion and renal arteriosclerosis, actual inflammation from micro-organisms, or combinations of these.

Albuminuria may be very transient. On the other hand it may persist for months without symptoms, but in the great majority of such cases, the symptoms will develop in six or eight months at the latest. Persistent albuminuria of renal source signifies nephritis. The reason for absence of symptoms in such cases is that the disease is very often chronic from its beginning, and slow in progressing.

The persistent absence of albumin in patients with symptoms of nephritis is not sufficient reason to give up the search. It may be absent for months or

even a year, during which time the symptoms of nephritis remain, or progress. There would have been many less diagnoses of myalgia, sciatica, debility, etc., in the Canadian Army if opportunity had permitted longer observation of the urine in such cases, a fact proven by later results on these men at this clinic. Insurance Companies would do well to place more stress on symptomatology, since it is proven to be often an earlier guide than the albumin reaction; the Companies would be handicapped by the hiding of symptoms by the applicants, but recourse might be had to functional tests and especially to the simple Respiratory Index above described which never fails to detect the acidosis so constantly present in even early cases of damaged kidneys.

The value of early diagnosis cannot be too strongly emphasized. It seems probable that in the majority of cases, nephritis commences as a gradually spreading inflammation, requiring various lengths of time to develop acutely. Even in those with whom the onset is said to be acute it is always found that certain symptoms preceded the attack, especially pollakiuria or lumbar pain or dyspnœa. These prodromal symptoms may antedate the acute attack only a few days, and the fact that the patient ordinarily does not seek medical aid until the acute attack occurs makes it impossible to diagnose the disease until the general anasarca and severe toxæmia render it self-evident. But it is in the cases who suffer for months without acute attacks, that an early diagnosis can be made. A patient with insipient chronic nephritis usually complains of *lumbar pain*, and *pollakiuria*. Headache was not found as a primary symptom in one such case. Usually, too, no albumin will appear in the urine at first. *Dyspnœa* will also be present, and though not always volunteered, can be elicited on questioning and proven by taking the Respiratory Index. If, therefore, a patient complains of lumbar pain or pollakiuria or both, with the urine negative, but with clinical evidence of acidosis, one may be very suspicious of nephritis and, as a rule, four to ten careful urine examinations on successive days will yield the clue in the form of albumin. The *dyspnœa* is usually a very early symptom.

It ought not to be forgotten that perhaps 15% of cases of chronic nephritis may remain symptomless for months.

The Course of the Disease—It begins variously with lumbar pain, pollakiuria and dyspnœa and may become acute almost at once or may remain chronic for years with danger of acute attacks. After recovery from an acute attack, symptoms persist but may, for three years be no worse than in those who have never had acute attacks. Weakness is invariable and loss of weight is the rule. Headache gradually develops after months in the purely chronic cases, but may persist throughout in those who recover from acute attacks. No rule seems to account for the development of arteriosclerosis, its presence in some cases and its absence in others. The heart at first is clinically normal but begins gradually to hypertrophy. Concurrently, but much more slowly, the blood pressure begins to rise. In such cases, especially, and in cases, too, with no elevation of blood

pressure or hypertrophy, toxic symptoms may suddenly appear, and may proceed at once to uremia, if the kidney function is poor. A patient with chronic nephritis has before him one of the following ultimate fates:—

(1) Death from uremia. (2) One or more acute attacks of nephritis, in any of which death may occur from uremia. (3) Death from cardiac exhaustion. (4) Death from intercurrent disease.

Influence of Atmospheric Humidity—Patients are invariably worse in humid weather, a fact which may not be sufficiently realized. A comparison of the weather chart with clinical records shows very strikingly that it is especially on humid days, patients suffer most from lumbar pain and headache. The barometric pressure and the temperature have no observable influence on symptoms but the humidity readings are almost a revelation in their application to the study of nephritis.

So definite an effect is exerted on the kidney tissues, indirectly, by increased atmospheric humidity, that the following interesting fact was observed:

Eleven patients under treatment became positive for albumin on one day only in the course of their observation here, being kept negative both before and after that day, by dietetic and eliminative measures. When such a patient became positive the urine was rechecked, it being proven that albumin was present. After this day, they were always negative again. No dietary indiscretion nor *any* cause for this provocation of albumin could be found until the humidity readings were consulted, when it was found that in each of the eleven cases the appearance of albumin had been on a day of markedly increased humidity. One example is given below:—

Case of H. M.

Date of Urinalysis	Albumin	Atmospheric Humidity
Dec. 6	negative	84
11	negative	67
13	negative	78
15	negative	71
17	negative	69
20	negative	63
22	negative	79
Jan. 8	negative	76
13	negative	81
14	negative	72
16	positive	82
17	positive	82
21	negative	77
24	negative	74
25	negative	63
26	negative	73
27	negative	79
28	negative	73

From this finding and from the fact that conditions of humidity played so great a role in the etiology, one concludes that humidity definitely affects the secreting tissue of the kidney. Probably it is because the efficiency of the skin as an eliminative organ is lowered and the kidney is thus made to bear the brunt of excretion of excessive toxins. The damage to the patient's tubular epithelium resulting from this virtual auto-intoxication, permits the passage through it of albumin; and in normal individuals, predisposes to nephritis, as was seen under etiology. It should be borne in mind by Insurance examiners that most reliable results in urinalysis will be obtained on humid days, for such days tend to show up the diseased kidneys.

DISABILITY.

Chronic nephritics who have never had an acute attack, and chronic nephritics for two or three years after recovering from an acute attack, stand light occupations remarkably well. This statement must be qualified to except the rather small number of severe cases who even in the early stages of their chronic disease suffer the toxic symptoms attendant upon a low kidney function. Such severe cases are really unable to work at all. But the great majority of nephritics do as well, if not better, at light occupations, than most other kinds of chronic sufferers. They have their good days, on which they feel very fit, and their bad days, on which they suffer from weakness, lumbar pain, headache, and depression of spirits. This up and down character of the symptoms is very characteristic and tends to make their work sporadic. When they are toxic, as occurs chiefly in wet weather, work becomes a great effort and they tire easily. When they are eliminating properly, and feel well they often overdo themselves, with consequences which might be expected. But if the patient is scrupulous as to his diet, diligent with regard to ensuring elimination, and temperate in exercise, he is able as a rule to earn a living. The choice of vocations for nephritics requires care because it is detrimental to them to engage in manual labour involving much muscular exercise and, on the other hand, they are often incapacitated for sedentary work since this involves the continual use of the eyes, and aggravates headache when present.

The estimation of a patient's disability is a difficult task. While the percentage of albumin in the urine may be some guide to the degree of active disease present, it is no guide at all to the disability, either present or future. Some with most albumin, tolerate work the best; and the most damaged kidneys will frequently give only traces of albumin, in the later stages of the disease. Kidney function tests such as the Phenolsulphonephthalein test and the water test, and also the exercise tolerance test called here the Respiratory Index, are actual readings of a man's disability.

It is time that the albuminometer was put down from the position it has usurped as a gauge of disability.

SUMMER DIARRHŒA IN INFANCY (GENERAL MANAGEMENT AND TREATMENT)*

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In spite of the enormous amount of investigation conducted in an effort to find the cause of summer diarrhœa in infants, the fact remains that the true ætiology is still enshrouded in mystery. The condition occurs regularly, in epidemic form, in practically every country and climate; it is one which lends itself readily to clinical, chemical, and bacteriological investigation; it is the greatest single factor influencing the infant death rate; and yet, with the exception of those few types which are obviously infectious or purely mechanical, we are forced to be content with the ennumeration of a list of causes, not specific, but merely contributory. Theories, as might be expected, are numerous, but not satisfactory. One observer lays great stress on the importance of bacterial infection; another equally competent observer, fails to isolate from the stools of a large series of cases, any bacterium which could be considered an ætiological agent. These discrepancies are apparent rather than real. Both observers, are in all probability recording their results accurately but their clinical material has been drawn from widely different localities, under very different conditions. A few writers emphasize the importance of bacterial contamination of the milk as a causative factor and then, with delightful inconsistency, refer to the resulting diarrhœa as a fermentative one, without offering any rational explanation.

It is quite conceivable that no single cause will ever be found for the common type of summer diarrhœa, but that it is due to a variety of agents operating either singly or collectively. These contributory causes are very important, since it is only by a study of them that we learn the prophylactic treatment, and by the application of them are able to attack the greatest stronghold of infant mortality. The most important are:

(1) The social status of the child, as it affects its general care, hygiene, and sanitation.

(2) Heat and humidity, the latter being considered by most writers the more important of the two.

(3) Excessive clothing; This is practised especially by the foreign element and has the same deleterious effect as excessive atmospheric heat.

(4) Improper food. It is estimated that only 3% of infants with summer diarrhœa are nursed exclusively. The great majority are fed on artificial food, and this may be injudiciously selected, it may be procured from the cow unhygienically, handled dirtily, kept carelessly, mixed ignorantly, or fed lavishly

*Read before The Ontario Medical Association, May, 1920.

and irregularly. The patent foods, rich in carbohydrate, must bear a large proportion of the blame for the causation of summer diarrhœa, and next in importance is raw milk.

(5) Malnutrition or chronic diseases. Everything which lowers the general vitality of the child increases the liability to diarrhœal disease.

(6) Parenteral infections. In an apparently healthy child a diarrhœa may accompany any infection, such as otitis media, nasopharyngitis, bronchitis, etc.

In the light of present knowledge the probable explanation of summer diarrhœa excluding the infectious or the simple mechanical type is as follows:— an infant, usually living in bad hygienic surroundings is the victim of overfeeding with either a patent food, rich in carbohydrates, or raw cow's milk, in which, due to careless handling, fermentation or decomposition has already begun, or which contains a large number of bacteria capable of producing chemical change. The infant's digestive mechanism may be normal but more frequently has been impaired by one or more of a variety of agents such as malnutrition or rickets, excessive atmospheric heat and humidity, ill-advised clothing, which prevents proper radiation from the skin, so necessary in hot weather, or by some parenteral infection. We know that in health the small intestine is seldom the seat of bacterial fermentation, but it is evident that this fermentation might occur much more readily after ingestion of milk contaminated with bacteria and already undergoing chemical change. Again, it is conceivable, that when a food rich in carbohydrate is fed, unabsorbed sugar may pass into the large intestine where excessive fermentation would take place. In either case the net result is identical. There is an abnormal decomposition of food, which manifests itself clinically by frequent, green, fluid evacuations, containing mucus and undigested milk, rarely blood, and by general symptoms such as fever, vomiting, toxæmia, and prostration, the extent of which is dependent on the severity of the diarrhœa. A brief outline of the known chemical and metabolic processes involved will assist you to understand why the disease manifests the tendency to progress from bad to worse, if not properly handled. Excessive fermentation produces, as end products, volatile and non-volatile acids. In the first group we find acetic, butyric and formic, in the second lactic. The latter is practically innocuous, but the former by reason of their irritating nature, produce increased peristalsis, copious watery and mucous secretions, and injury to the mucous membrane of the bowel. In its turn the increased peristalsis prevents proper digestion and absorption of fat and carbohydrates. The watery secretions produce dehydration, and the injury to the mucous membrane favours absorption into the system of toxic products. The kidneys are affected by the resulting concentration of urine, anuria develops with a consequent retention of acid sodium phosphate, the reserve alkali of the body is drawn upon to neutralize the excessive acidity in the intestine, acidosis supervenes and finally we have a dangerous derangement of the whole general metbolism of the body.

Before we consider the treatment of these cases the importance of prophylaxis must be insisted upon—First and most important is the necessity for education of the poor and ignorant on all matters relating to infant feeding and hygiene. Second, the maintenance of fresh air resorts during the summer months. Third, the supervision of a child's diet through the medium of outpatient clinics, well baby clinics, and milk stations. Here the mother is supplied with pure milk and useful advice. Fourth, the clothing of the infant should be as loose and cool as possible. Frequent sponging with tepid water prevents overheating and promotes cleanliness. Cool boiled water should be given frequently during the day. Maternal nursing should be encouraged by every possible means and if this is not possible all milk fed to the baby during the hot weather should be boiled.

Our ability to treat intelligently, cases of diarrhœa is dependent primarily on our ability to recognize four main types.

1. Mechanical Diarrhœa, occurring as a rule in older children, due to ingestion of fresh fruit or other indigestible food. A slight elevation of temperature is common and particles of undigested food are found in the stools. The condition is readily relieved by administration of a laxative to clear out the offending substance in the intestine, and by underfeeding the child until normal conditions obtain.

2. The type associated with a parenteral infection. The presence of some infection such as bronchitis, otitis media or pyelitis preceding the diarrhœa is sufficient evidence as to the ætiology of the intestinal disturbance. The diarrhœa is merely an indication of a lowering of the digestive capacity, and the treatment consists in reducing the quantity and concentration of the food ingested.

3. Chemical diarrhœa. This is the usual variety that occurs in the summer epidemics and is practically always of the fermentative type. As a rule it develops suddenly with vomiting, fever and diarrhœa. In mild cases constitutional symptoms are not alarming, but in the severe forms there is restlessness, general nervous excitability, and convulsions, or more frequently, dull stupour, general relaxation, staring sunken eyes, open mouth, feeble cry, and aimless movements of the extremities. The stools are watery six to fifteen a day, green in colour, frothy and containing mucous, but very little fæcal substance. When examined on the napkin such stools are very deceptive and it is difficult to realize what an enormous loss to the body they represent. The water loss itself is four to eight times the normal; the salt loss two to ten times the normal and the total dried weight of very loose movements, is frequently twice the dried weight of normal ones: a strong acetic or butyric acid odour, coupled with a pronounced acid reaction to litmus paper is a constant characteristic of these stools, and one of considerable diagnostic value. The test for acidity is a very simple one, and is employed much less frequently than its importance warrants.

From a study of the chemical factors involved we derive our two main indications for treatment viz; correction of dehydration and counteracting of the excessive fermentation. I have placed the two indications in this order because it is the correction of dehydration that is so immediately necessary in many cases to save life. The administration of a suitable diet is of course essential if a permanent cure is to be effected. The amount of fluids required must be determined by the physician and his calculation should be based on the frequency and character of the stools, the loss of elasticity in the skin, the general appearance of the child, and the daily weight curve. In severely dehydrated patients with profound toxæmia, as much as 1200 to 1500 c.c are required in 24 hours. Cool boiled water should be given by mouth at every opportunity, and it is amazing how much can be introduced in this manner. The next most important method of administration is by hypo-dermoclysis, normal saline and 5% glucose being the solutions commonly used. 250 c.c twice a day can be injected into an infant weighing from eight to twelve pounds. It has been suggested that the injection of a solution of various salts such as calcium, magnesium, sodium and potassium would more adequately correct the salt loss from the body, but experience shows that if the solution is to be kept isotonic the concentration of these salts would be too low to be of any real value. The intraperitoneal injection of fluids has several points in its favour; it is quickly administered, larger amounts can be given at one time and absorption is a little more rapid, but it is a method more adapted to hospital treatment than to private practice, and it is not altogether devoid of danger. The intravenous route is useful when immediate introduction of fluids is indicated, but only small amounts can be given, and it has the disadvantage of more difficult technique.

In selecting the diet the physician should have in view the correction of intestinal fermentation. No food answers the purposes so well as protein milk, the formula for which may be found in any recent text-book on pediatrics. Its preparation however, entails a good deal of patience and experience and it use is therefore restricted. This milk has recently been put on the market in powdered form and has proven clinically to be an excellent substitute for the original. It is wise to give, at first, small amounts, every three hours, of a 2/3 or ½ strength dilution, I am convinced that it should be given as soon as the diagnosis is made. As the milk is given for its therapeutic effect, I cannot see the object of a preliminary withholding for 24 hours, of everything but water or barley water. When the stools decrease in number and improve in consistency, sugar, preferably in the form of dextri-maltose, should be cautiously added.

If protein milk in either liquid or powdered form, is unobtainable, 2% milk, diluted, unsweetened and boiled offers a food which is low in fat and moderately low in carbohydrate. The protein percentage may be raised by the addition of casein flour, with the result that the formation of calcium soap stools is materially assisted.

A word or two will suffice for the minor points in treatment. Initial purgation is, in my opinion, not a rational procedure as it only aggravates the dehydration. Colon irrigations have long since fallen into disrepute and rightly so. Occasionally they may have a temporary beneficial effect by reducing pyrexia. Bismuth, by mouth, rarely seems to have any other effect than to change the colour of the stools. Opium occasionally is useful in reducing the number of evacuations and quieting tenesmus, if this is a distressing symptom. If definite hyperpnœa develops, denoting acidosis, 5% glucose solution interstitially and intravenously is urgently indicated. The injection of sodium bicarbonate solutions has not produced the beneficial effects expected of it.

4. Infectious diarrhœa. These cases are not very frequent, but their recognition is imperative, if treatment is to be attended with success. Any diarrhœa associated with very frequent stools containing blood, mucus and pus should be viewed with suspicion. If, in addition it is found that the freshly passed stool is alkaline to litmus, I think one is justified in treating the case as one of infectious diarrhœa. The diagnosis can be confirmed only by isolating the infecting organism from the excreta, and this is not always practicable. The reason it is so essential to recognize these cases is that the diet is of the utmost importance in their treatment, and it is a very different diet to that given for the ordinary fermentative diarrhœa.

The gastro-intestinal tract is the seat of a specific infection, usually by the bacillus dysenteriæ, producing abnormal putrefaction of proteins, liberation of toxic products of putrefaction and specific bacterial toxines, and absorption of the same through an intestinal wall which has been injured by the infection. To correct this a high carbohydrate diet is indicated and this is best supplied by means of a 5% lactose solution given every two or three hours, twenty or thirty ounces being administered in the day. This may be continued for two or three days, when it is advisable to add gradually milk and cereal gruels. The beneficial effect of this lactose regime will be seen in a reduction of temperature and a decrease in the number of stools. Protein milk theoretically and practically is contraindicated in the treatment of this condition. Dehydration, though not so severe as in the fermentative type of diarrhœa almost always requires the administration of fluids interstitially for its correction.

In conclusion, gentlemen, I should like to call you again to a realization of the seriousness of this condition. Its ravages carry off annually more infants than do measles, dyphtheria, scarlet fever, pertussis, and typhoid fever combined. It is a condition which is to a large extent preventable if we have the courage of our convictions and it responds readily to treatment if this is begun promptly, and conducted energetically and intelligently.

From the wards of the Hospital for Sick Children Department of Pediatrics, University of Toronto.

THE FEEDING INTERVAL IN NURSING INFANTS*

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All authorities are agreed that there should be some stated times at which the baby should receive nourishment. The length of the interval between feedings is still, however, an open subject with many pediatricians, and most obstetricians leave this question for the mother or nurse to decide. The opinions of some of the leading pediatrists are as follows,—

Holt (1) advises feeding every three hours during the day up to 6 months of age, and thereafter every four hours.

Still (2) says, "Infants should be fed every two hours for the first two months, then every two and a half hours to the third month, then every three hours."

Piere Budin (3) advises feeding every two hours.

Morse and Talbot (4) say, "It is evident that the intervals must be determined in each case on the conditions actually present in that case, not by any set rules."

Grulee (5) favors the four hour interval from birth, saying, "It has been my custom for the past few years not to feed any infant oftener than every four hours. There is no better prophylactic for overfeeding and consequent colic."

In reviewing the literature we find that Litzenburg (6) applied the four hour method of feeding to premature infants, but his methods are perhaps open to objection. Pisek (7) says that an infant can be trained to take the breast every four hours, but that it is not the natural interval, and unless the infant is healthy and vigorous he is apt to fail shortly and need additional food. Pritchard (8) feeds infants every four hours, but cautions that in primipara it is sometimes necessary to weigh before and after nursing, and if the child is not getting sufficient nourishment to supplement it. Smith and LeWald (9) favor long intervals between feedings. Thus it is seen that while some favor it, yet there is not a great deal support for the four hour method of feeding.

Before considering the advantages of the four hour method of feeding, it might be wise to consider some of the disadvantages of the two or three hour method. The most common nourishment disturbance in the breast-fed baby is dyspepsia, and the essential cause is overfeeding, whether this occurs by giving too much at a feeding or from nursing too often. However, the condition is most frequently seen among babies who are fed irregularly and at too short intervals. It may occur in a baby fed every four hours, but is quite rare. When

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a child is fed on a short interval the stomach will not have had time to empty itself of all the previous feeding when a new feeding is put into it. Thus there is an accumulation of food in the stomach, and the usual method of getting rid of it is by vomiting. Another consequence is a hurrying down of the foodstuffs with the production of colic and diarrhœa. The stools in this condition are grass green in color, contain many undigested curds, and frequently considerable mucous. They are usually passed from four to eight times every twenty-four hours. Much flatus is also expelled. The nervous disturbances are frequent. The child is cross and fretful, and cries repeatedly. The sleep is light and disturbed. The weight curve of these infants is almost sufficient on which to make a diagnosis. There is at first a marked gain in weight, succeeded by a plateau, and then a fall. The treatment of the condition is usually not difficult. If the baby has been fed every two hours or oftener it is frequently only necessary to lengthen the interval to four hours. In some cases this is not sufficient. Here, one must not only lengthen the interval, but the nursing period must be diminished to five or even three minutes, thus lessening the amount of food to considerably below normal for the time being.

In making an investigation into the relative merits of the two, three, and four hour interval methods of feeding one of the first considerations is to compare the amount of food taken per feeding and per twenty-four hours. To determine this ten babies chosen indiscriminately according to the order of their delivery were fed at two hour intervals, and their weight taken before and after each nursing. In this way the average amount of breast milk per feeding, and also the total amount for the day were obtained. These weighings extended over fourteen days, at the end of which time the mother and the baby were usually discharged from the hospital. Similar weighings of ten babies fed every three hours and every four hours were obtained. The results are seen in Figure 1.

AMOUNT OF FOOD TAKEN PER 24 Hours in ounces.

Interval	Days 1	2	3	4	5	6	7	8	9	10	11	12	13	14
Q.2 h x 10	½	2¼	7	13	14¼	16	18¾	17	17⅝	16½	17	18½	18½	18
Q.3h x 7	1	4¾	8	11½	12	13¼	14	15⅜	16¼	15⅜	15¼	15¾	15	15¾
Q.4h x 6	¾	1½	4¼	7¼	8½	9½	10½	11¼	12⅜	13¾	14	15	14¼	14

N.B. Ten babies taken in each series.

Irregularity in first three days probably due to varying amounts of saccharine given.

Figure 1.

It will be seen that the figures do not show much regularity for the first two or three days, probably due to the child receiving varying quantities of water sweetened with saccharine, but after the first few days those babies fed every two hours ingest on an average two or four ounces more per day than those on the three hour interval, and six to eight ounces more per day than those on the four hour interval. This is quite a considerable amount, and may easily lead to the state of dyspepsia mentioned above.

The curve (Figure 2) which has been drawn will show more clearly the relationship between the amounts of food taken per day on the different intervals.

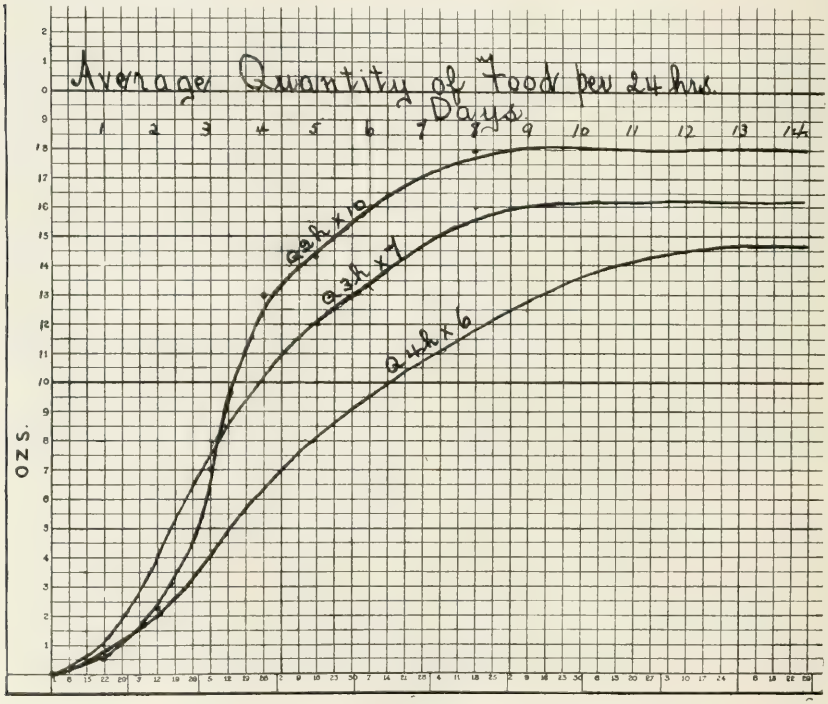

Figure 2

In Figure 3 will be seen the average amount of food taken at a feeding on the two, three, and four-hour interval.

It will be seen that by the end of the tenth day those babies fed every two hours take about 1.7 ounces per feeding, while those fed every three hours or every four hours take about 2.2 ounces, or nearly one-third more per feed.

AMOUNT OF FOOD TAKEN PER FEEDING.

Interval	Day.							
	5th	6th	7th	8th	9th	10th	12th	14th
Q2h.x 10	1.4	1.6	1.8	1.7	1.8	1.6	1.8	1.8
Q3h x 7	1.7	1.8	2.0	2.1	2.3	2.2	2.2	2.2
Q4h x 6	1.3	1.5	1.7	1.9	2.1	2.2	2.3	2.3

Figure 3.

The question naturally arises "Is the stomach large enough to hold this increased amount of food?" Many experiments have been done to estimate the size of the infant's stomach, but it is not necessary to enlarge on this subject here as it has no bearing. There is a considerable difference between the anatomical and the physiological size of the stomach. Moreover, our best proof that the stomach will hold this amount, and do it quite easily, is that it does so. The child may take three, four, or five ounces at a feed, and still not regurgitate. As a possible explanation of this we know that within ten minutes of entering the stomach some of the food passes out in a thin stream into the duodenum. Cannon (10) has demonstrated this by the bismuth shadow, and his work has been confirmed by Pisek (7) and others.

The next step in our investigation was to compare the weight of babies fed every two, three, and four hours while they were present in the hospital, the length of their stay, as before, being about 14 days. Up until July, 1914, babies delivered at the Burnside Hospital were nursed every two hours. From this hospital's records the weights of two hundred consecutive babies fed at this interval were noted at birth and at discharge. The initial loss was also noted in each case.

From July 1914 to October 1914 the babies delivered were fed on three hour intervals, and from October 1914 up to the present time on four hour intervals, and similar records for these two classes were obtained in this way. The results are seen in Figure 4. It will be observed that the average birth

SUMMARY OF GAIN IN WEIGHT IN FOURTEEN DAYS

	W'T at birth	Initial Loss	Gain in 14 days
Series No. 1 q .2h.	6-13¾	-9	-9¾
Series No. 2 q. 3 h.	7-4	-9½	-9½
Series No.3 q. 4 h.	6-14¾	- 9¼	-6½
Average or 600 cases	7-0	- 9¼	
N.B. 200 cases in each series.			

Figure 4.

weight of 600 babies was 7 lbs., and the average initial loss was 9¼ ounces. This loss occurs during the first two or three days, and can be accounted for by the loss of water in the expired air, in the perspiration, in the urine, and in the meconium. This initial loss bears no relation to the method, nor to the amount of feeding. It is not seen in other mammals, and is probably a purely human physiological process.

The interesting fact in these averages is that the infant fed every four hours does not regain its birth weight in fourteen days, as those fed every two, or three hours do. In fact it only gains 6½ of the 9¼ ounces lost, and so at the end of two weeks is still 2¾ ounces lighter than when it was born. We will discuss this later. These results are shown more graphically by curves in Figure 5.

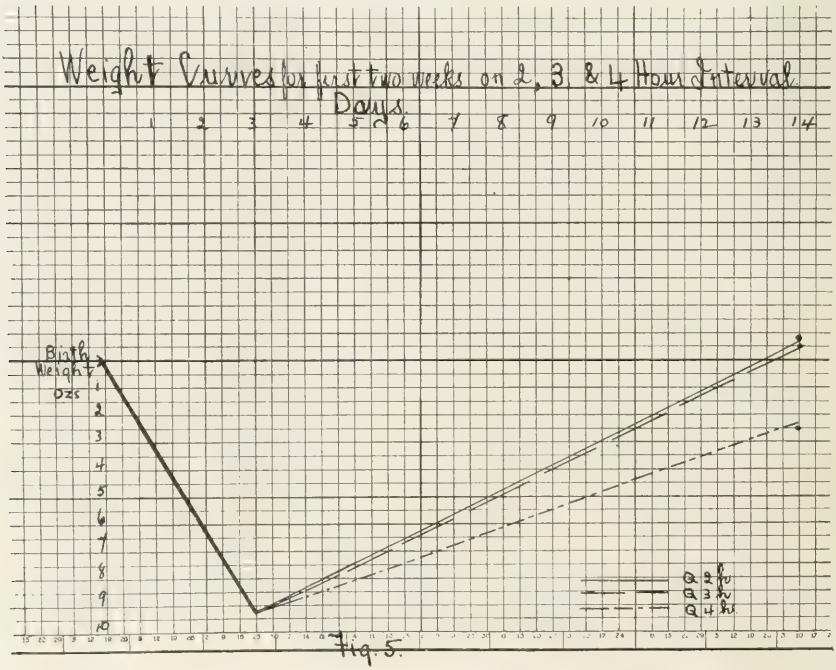
Weight Curves for first two weeks on 2, 3 & 4 Hour Interval
Days.
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Birth Weight
ozs
1 2 3 4 5 6 7 8 9 10
Q 2 hr
Q 3 hr
Q 4 hr

Fig. 5.

The next step was to divide these two hundred cases in each series into classes according to their weight, and see if the same general results held true in each class. The classes are six in number, and are as follows:— B. under 4 lbs., C. from 4 to 5 lbs., (These two classes were all prematures), D. from 5 to 7 lbs., E. from 7 to 8 lbs., F. from 8 to 9 lbs., and G., over 9 lbs. The results are as follows (Figure 6).

SUMMARY IN CLASSES ACCORDING TO WEIGHT.

Class	Series 1, q.2 h.		Series 2, q 3 h.		Series 3, q 4 h.		Loss %
	Loss	Gain in 14 days	Loss	Gain in 14 days	Loss	Gain in 14 days	
"B" under 4 lbs. (5 cases each)	-6¼	-2½	-5¼	-3	-5¼	-1½	13%
"C" under 5 lbs. (10 cases each)	-6	-4	-6	-5⅛	-6¼	-4¾	8%
"D" under 7 lbs.	-7¾	-9	-8	-9	-8	-6¼	7.5%
"E" under 8 lbs.	-9¾	-10¾	-9½	-10½	-9¼	-7	8%
"F" under 9 lbs.	-12½	-13¼	-11¼	-9¾	-12	-6¾	9%
"G" over 9 lbs.	-13¼	-12	-13½	-7¼	-13¾	-5	9%

Figure 6.

Here again the important fact to observe is that the gain is considerably less in all classes of the q.4 h. series with the exception of the two lightest classes, that is the prematures.

From these results we see that at the end of two weeks the baby fed every four hours is almost three ounces lighter than those fed every three and every two hours. Undoubtedly this is due to his lessened food supply, and it looks as if he is being underfed. Yet according to the appearance of the child he is not starving; in fact, he is progressing. He is happier as a result of the absence of digestive disturbances, due to the more complete digestion and assimilation of his food. He does not regurgitate, he never vomits, and he does not know what colic or diarrhœa is. He has a good appetite, and sleeps longer and better.

However, there are some further results worth mentioning. The above records only carry us as far as the fourteenth day of the baby's life. His later life is interesting. The series of two hundred babies fed every four hours has been followed up. The method was as follows:—At the Burnside Hospital a card index of all babies who have been delivered in the public wards is kept. The city nurses visit these babies once a month, and report on the weight, the method of feeding, and the general condition. In this way a follow-up system has been maintained ever since October, 1914. So the records of the babies which comprised the report of the two hundred during their stay in the hospital were investigated in this card system, and their weight obtained for a number of months subsequent to their discharge from the hospital. Only those who were being nursed at the breast every four hours were included in the report. Some of the mothers were not following instructions, and were feeding their infants at various and varying intervals; but there were many who still held rigidly to what they had been taught in their stay in the hospital. These still nursed the baby every four hours, and they were quite satisfied with the result.

As sufficient records of the original two hundred babies were not available to obtain good averages, additional records were sought where the same information could be obtained. These were found in the files of the North Toronto Child Welfare Clinic; and, of course, only the weights of babies nursed

every four hours were used. In this way sufficient readings were obtained to make a fair average. Weights were approximated to the nearest half month, and the average weights up to six months of age were made from 21 to 45 individual weighings, and from 6 to 9 months from 8 to 20 weighings. Figure 7 shows the average weight at the various half months, and the number of weighings from which the average was obtained.

Figure 7.

Weight of Babies Nursed Every Four Hours.

Months	No. of weighings.	Average Weight.
1	21	7 lbs. 12 oz.
1½	46	8 " 15 "
2	34	9 " 12 "
2½	28	10 " 9 "
3	29	11 " 9 "
3½	26	11 " 10½ "
4	27	12 " 6 "
4½	23	13 " 5 "
5	26	13 " 9 "
5½	23	15 " 2 "
6	21	15 " 6 "
6½	17	16 " 13 "
7	15	15 " 3 "
7½	14	17 " 2 "
8	11	16 " 6 "
8½	12	18 " 0 "
9	8	17 " 5 "

A curve of the average gain of these babies up to 9 months of age has been constructed (Figure 8), which shows the results more graphically.

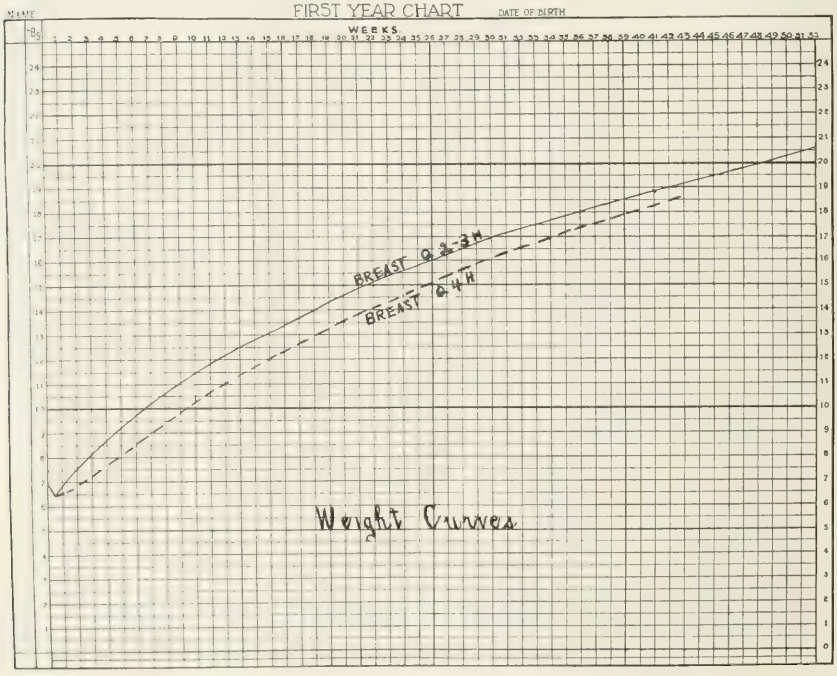

Figure 8

You will see that this curve is compared with one taken from Holt (1), which latter represents the normal gain in weight for a breast-fed baby fed presumably every two to three hours. It is interesting to see that the weight of the baby fed every four hours approximates very closely that of Holt's curve, and in no part is more than one pound below it. Thus it is seen that these babies are not being starved, but are growing to approximately the same degree as babies fed more frequently.

The chief point of interest, however, lies in the fact that very few babies fed every four hours suffer from dyspepsia. In our experience it has been a comparatively rare occurrence to see vomiting and colic in such a baby. Furthermore, it is a common experience to see a baby fed every two or three hours suffering from dyspepsia which clears up entirely when changed to a four-hour feeding.

In considering the four-hour interval, there is another point worthy of note, and that is the mother's attitude. In a considerable number of cases the mother is prevented by social and household duties from giving much time to her baby. Frequently the mother is too busy otherwise to nurse her infant every two hours, and so the baby is weaned. It is unnecessary to remind you of the danger of this procedure. But, when a mother can nurse her infant at two o'clock in the afternoon, and then be free until six o'clock, she is much more likely to undertake her duty, and nurse her child, thus increasing its chances of life perhaps ten times. This point is important, and should not be overlooked.

In summarizing our results, I would recall your attention to the following points:—

(1) The frequent production of dyspepsia in infants fed every two or three hours, and the comparative non-appearance of this condition in the four-hour interval baby.

(2) The considerable difference in the amount of food taken per twenty-four hours on the two, three, and four-hour intervals.

(3) The tardiness of recovery of the birth weight in the four-hour interval baby, but the subsequent gain in weight, which corresponds very closely to the rate of gain of babies fed every two or three hours.

(4) Almost complete absence of digestive disturbances in babies fed every four hours, and the rapid improvement of dyspeptic babies when changed to a four-hour interval.

(5) The comparative facility with which mothers can be induced to nurse their babies on the four-hour interval.

(6) From the above points I would have you draw the conclusion that the wisest method of feeding normal infants is on the four-hour interval, or at the following hours: 2, 6, and 10 a.m., and 2, 6, and 10 p.m., at the end of one month discontinuing the 2 a.m. feeding. If, however, it is seen that a baby is not getting sufficient food on this interval, and is not gaining in the normal way, then the food should be increased by nursing every three hours.

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PROSTATECTOMY

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One of the most distressing and terrible, as well as the most common maladies to which we, as men, are liable to fall heir, is an enlarged prostate. In the evening of life, after one has worked a lifetime and earned the small reward of a few years' rest and repose, one cannot imagine a more tormenting existence than the obstruction caused by an enlarged prostate, with its accompanying complications. On a fellowship examination in London a candidate was handed an enlarged prostate and asked to name the occupation of the former owner. After replying that he could not possibly do so, the examiner laughingly replied that it had been "that of making water." We have all seen these pitiable patients, and until very recently we could not hold out much hope of bettering their miserable condition. A catheter life was theirs until uræmia or pneumonia was kind enough to relieve them of their suffering. The removal of the organ was so formidable on account of the high mortality that few physicians cared to advise it. However, with the rapid advance which surgery has made in recent years, and particularly the genito-urinary branch, that of the prostate has been most marked, not from the standpoint of operative technique, but from diagnosis, preparation and after treatment. Instead of a mortality of from 50 to 70%, as was the case a few years ago, the mortality is now, in expert hands, about 4%, or as low as any other major operation. This is the more remarkable when one considers the age of the majority of the patients with whom we have to deal.

My aim in reading this paper to-night is to present it more from the viewpoint of the physician than of the surgeon; therefore the operative technique will be more or less concise, and I will deal more particularly with the other considerations. It is very interesting, therefore, to discuss very briefly the etiology and pathological anatomy.

The etiology is not exactly known, so we will not waste time with that. The most advanced theory of benign hypertrophy is to-day, that it is caused by some remote chemical change in the glandular epithelium, which causes a proliferation of the epithelial cells themselves. This, however, is only a theory, and nothing has ever been done to prove it.

A very common idea is that increased sexual indulgence is a cause; another theory is that chronic prostatitis, both specific and non-specific, is a factor. These ideas are not borne out by observations. I have gone over seven hundred very complete histories of enlarged prostate, and I could not find such to be the case. The majority did not give a history of gonorrhœa or prostatitis. There was this,

however, to be noticed, that there were many more Protestant ministers on our lists than Catholic priests, but as I am sure there are many more of the former than of the latter, I will have to let you draw your own conclusions.

The etiology of carcinomatous enlargement of the prostate is, of course, as little known as carcinoma of any other organ.

Pathological Anatomy:—The prostate is composed of five lobes—anterior, posterior, two laterals and a median. Anatomically this is an embryological classification. The anterior lobe very seldom gives us any trouble. Pathologically, however, the other lobes do, and probably the median is the worst offender. Composed of very active glands, and situated, as it is, between the ejaculatory ducts behind and the urethra in front, a very slight enlargement encroaches upon and compresses the urethra. This is of very practical importance, as from this lobe you may get acute and absolute retention, with no enlargement per rectum. The two lateral lobes are very frequently enlarged, but the posterior, which is in a sense the prostatic capsule, in hypertrophy, is very seldom the offender, except in carcinoma. Here it is, however, that malignancy nearly always starts, and can usually be detected by a nodule of stony hardness in examining per rectum. Any of these enlargements may be either intra or extra vesical, growing as they do up through the orifice under the mucous membrane and pushing the internal sphyncter aside, so that one may have a huge prostate growing into the bladder and feel none per rectum. There are many other points in the pathology of the prostate, such as lengthening and curving of the urethra, growing, as it does, to accommodate itself to the changes in the size and shape of its immediate surroundings. Also the median bar, and contracted vesical orifice, but I will deal concisely with these under diagnosis. Suffice it to say that the median bar and contracted orifice are end results of inflammation, chiefly of a former prostatitis, but also very often of a cystitis, and they are quite as capable of causing just as aggravating symptoms as a huge prostate.

Diagnosis:—A moderate or huge sized prostate, with its very well known symptoms, is one of the easiest things in the world to diagnose, *but* the cause of acute retention or sub-acute retention with frequency and its accompanying symptoms is by no means quite so simple. There are so many causes for this that it is imperative to find out exactly the cause before attempting treatment, otherwise our efforts will result in failure.

In the first place a prostatic patient of the benign hypertrophy type seldom seeks relief before the age of fifty. If he has acute retention our treatment is, of course, catheterization, but if he seeks relief for frequency and nycturia or hæmaturia, or the various symptoms of cystitis, which, by the way, is only a symptom, and we find he has not enough enlargement per rectum to think his prostate is the cause, it is well to attempt to pass a good sized catheter, in order to rule out a stricture, as this in old men is very frequently a cause of their trouble. Not finding either an enlargement per rectum or a stricture, one of several other things may be a cause. The median lobe is the most common. This may completely obstruct without much apparent enlargement. The median bar,

which is a fibrous obstruction across the vesical orifice, is also a very common cause, but it is usually found in younger patients. A contracted vesical orifice, which, as I have said earlier, was usually caused by a cystitis, is frequently the cause of obstruction. Then again, one may find a tumour of the posterior urethra or a polyp or growth, either benign or malignant, growing around the vesical orifice and causing obstruction. There is another cause which is much more common than usually supposed, and that is "tabes." In these cases one may get complete retention. It is interesting, however, to note that when a catheter is passed in these cases the urine flows very slowly, and not with the characteristic gush as in other conditions. This is a very important point, and quite noticeable. It is caused from atony of the bladder muscle and loss of tone. These spinal lues cases have retention early, because they cannot open their sphincter, owing to the sudden block of the sensory nerves. Later they have incontinence from complete paralysis. A Wasserman helps to clear these cases, but many have negative Wassermans. In that case a spinal puncture with cell count and colloidal gold test will invariably clinch the diagnosis.

If, then, you have retention or residual urine and not much enlargement, it may be one of many things. If it is very hard in any place it is wise to pass a sound in the urethra and a gloved finger in the rectum, and feel for any thickening in the lower part of the prostate. It is in the lower part of the posterior lobe that carcinoma generally starts, and in the absence of a cystoscope one can very frequently diagnose between a median lobe and a carcinoma in the following way, remembering that the median lobe lies in the upper part of the prostate, between the ejaculatory ducts and the urethra, while the carcinoma usually starts below. If it is carcinoma one can feel the unnatural thickening in the lower part, between the sound and the finger, and the former can also be easily felt above through the bladder. The upper part of the prostate is here, not much thickened. If it is a median lobe it is the reverse. That is, the thickening is above and the natural feeling below. You also have the absence of stony hardness. If it is carcinoma and fairly advanced, it is immovable from induration, and one can sometimes hook the finger over the hard mass at the top and feel the soft bladder above, for carcinoma usually extends within the capsule and does not invade the surrounding structures until comparatively late. The median bar is, without the cystoscope, sometimes diagnosed by exclusion.

In all these obscure cases, where the symptoms are aggravating and the prostate is not much enlarged, I think the only satisfactory way of making a diagnosis is with the cystoscope. This is not only the means of diagnosing the cause of the obstruction, but complications can be diagnosed as well, such as a stone in the bladder, tumour or diverticulum, the presence of which should always be known in order to carry out good surgery.

As an illustration of this I may mention a case I have in the hospital. He is 81 years of age and has had, first a frequency, and then incontinence for four years. This last two years he has had almost continual bladder spasms. He had been examined repeatedly and as often rejected as a poor risk for prostatectomy.

He was also X-Rayed for stone, with a negative finding. I cystoscoped him a week ago and found, not an enlarged prostate, but a huge stone lying on the trigone, with the bladder tightly surrounding it. I removed it two days later in spite of the fact that he had a blood pressure of 212, and took out a stone the size of a small peach. At present he is doing nicely, and needless to say he is much better. This only shows the importance of cystoscopy when possible.

So much for diagnosis. Let us now turn our attention to the all-important point of preparation, for it is in this that our success or failure lies. The preparation and choosing of a patient for operation is the all-important question, and that first raises the question, "When should a patient be operated upon?" Some time ago I heard a paper read on prostatectomy, and in the discussion which followed a physician asked the question, "When should we send a prostate case to a surgeon for operation?" This question was not directly answered. Let me answer it now. If you are not sure yourself do not send him for operation, but send him for examination. When a man is having symptoms, that is, night frequency and day frequency, and carrying around 100 c.c. or more of residual urine, and especially if it is infected, as it usually is, then I say the longer he goes, the worse for himself, for I am a thorough believer in ascending infection and back pressure up the ureter, and these will certainly increase rather than diminish. Just as soon as a man gets obstruction to urination, be it what it may, prostate, stricture, median bar, lobe or any other obstruction, it quickly and surely acts like a dam to a stream of water. The bladder quickly responds to this condition. The musculature of this viscus becomes hypertrophied, the bladder wall becomes thickened, and nature does her best to help us out. In time, however, the limit is reached—the bladder wall starts to give way, and stretch between the muscle bands, resulting in the formation of cellules and diverticula. The patient is at this time not entirely emptying his bladder; deposits of different forms of salts begin to take place, sometimes, and not infrequently, these result in the formation of stones; quite often indeed in the cellules and diverticula. Sometimes they lie loose in the bladder, and when they become large, lie on the trigone, keeping up a continual irritation and bladder spasm, just the same as a foreign body in a uterus. Then the inevitable results. The urine becomes infected, and a baciluria is added to the already troublesome condition. Every time the bladder is emptied the mouths of the ureters are forced open and infection takes place there. Gradually the ureters become dilated, then the pelvis of the kidney, and finally the parenchyma of the kidney itself, until, if the patient lives long enough, the ureters become as large as a broom handle, and the whole urinary tract is one mass of pus. At autopsy we frequently see this condition, but fortunately these cases are becoming less frequent. It will be seen, then, at a glance that as the tendency is to increase and not to diminish, the only sane thing to do is to get rid of it, and I believe there is only one way to do it, and that is by operation. Other methods have been tried and have failed. One cannot massage away a benign hypertrophy. In fact, if you massage one which is on the point of causing acute obstruction, you will very often hasten the same by

the localized hyperemia which you cause by so doing. Furthermore, if you use much pressure, especially for a prolonged period of time, you cause a certain amount of periprostatic adhesions, which makes it much more difficult for the man who attempts to remove it.

Radium has been tried. I have used it myself, and although I know of one case where it seemed to do good, the vast preponderance of opinion is that its effects are about the same as massage, especially in producing fibrous adhesions around the gland, and as we depend on enucleation for removing the prostate, any adhesions render the operation much more difficult. Radium, however, is of very great benefit in pre-operative and post-operative treatment in cases of carcinoma. A course of five or six applications of radium to the prostate, both per rectum and intra-urethral, will undoubtedly delay the growth. Its action on cancer is not well known, but it is supposed to act by inhibiting mitosis, and is certainly indicated in cases where one is going to do a perineal operation. If it is carcinoma, one must not consider they are all inoperable. Their condition can often be very much bettered by the removal of the obstruction, but one must consider their age and general condition. It may be better in some cases to advise a catheter life, although one must remember that the average catheter life is about two years, 10%—six weeks. In very old men who are in poor condition with carcinoma, I certainly would advise this course. The treatment of other cases will be referred to later.

If, then, we decide on operative treatment, the next considerations are:—

1. Is it carcinoma? This is of very great importance.
2. The condition of your patient.
3. The kind of a prostate with which you have to deal; i.e., is it intra vesical or extra vesical, median lobe or median bar? Have you complications such as a large or small stone, diverticulum papilloma or carcinoma of the bladder? All these things should be taken into consideration in order to give your patient the best chance of recovery. If it is intravesical, for instance, and you also should have a papilloma of the bladder, one would never think of doing a perineal operation, but would go in from above. If, however, you had an extra vesical, with no bladder complications, one would probably go in from below.

If, also, you were dealing with a median bar instead of an hypertrophy, then the most simple way of removing this difficulty would be by a punch operation. This can be done under local anæsthesia. The punch is introduced through the urethra and the obstructing portion is removed. A large catheter is then inserted for a couple of days to prevent hæmorrhage, and the patient is around in four or five days.

The condition of the patient is of prime importance, for no matter how perfect an operation is in technique, if our patient is a poor risk the results will be fatal. In no operation is judgment so necessary, for if he is in poor condition at the time, it is almost always possible to get satisfactory improvement by proper treatment. Of course, his general condition counts for much. His age, the condition of his heart, chest and blood pressure is all important, but the prime factor is the function of the kidneys.

There are two ways of improving this:—

1. By supra-pubic drainage.

2. By the retention catheter.

In doing a routine preparatory examination, one should know the amount of residual urine; whether it is infected or not, and also whether he has a stone or a carcinoma, as a patient with either of the latter never does well with a retention catheter. I prefer an indwelling catheter for two reasons chiefly. It necessitates one operation only, and therefore one anæsthetic, which is a big consideration. Also, the kidneys have been accustomed to secreting against pressure, and in the presence of infection for a long time. Very often these patients have a high blood pressure. Now, then, and particularly in cases of great retention with uninfected urine (note, I say uninfected urine), if you suddenly remove the pressure by supra-public drainage, the kidneys cannot quickly accommodate themselves to the sudden change. The blood pressure quickly falls, your patient stops secreting, and goes off into uræmia. Other than interstitials and stimulants you are helpless. The former condition cannot be brought back. On the other hand, if you utilize catheter drainage, and watch the blood pressure, secretion and condition generally, and your patient starts to go bad, you can at once very easily remove your catheter for a while till he returns to a better condition, and then probably catheterize every eight hours for a few days.

There are many kidney function tests, all of which are made use of by various men, the ones most commonly used being the Floritzan, Indigo-carmin, water, urea and phenol sulphone-phthalein test. Of these the latter is the one most generally used. It was perfected by Drs. Geraghty and Rowntree, of Johns Hopkins Hospital. It is a mono sodium salt, and contains 6 milligrams to 1 c.c. of distilled water. No one thing has done more for genito-urinary surgery than this test. It consists of 1 c.c. being injected intra-muscularly or intra-venously into the patient. The patient is then catheterized, the residual urine drawn off and the catheter left in the bladder. If given intra-venously, the normal appearance time is three minutes. The drug shows in the urine by adding a few drops of sodium hydroxide to the vessel in which you are collecting your specimen. If given intra-muscularly it takes about ten minutes to appear. A longer time usually denotes impairment of kidney function, or imperfect technique.

One hour from its appearance time, the urine is collected. Then again at the end of a second hour. Each specimen is diluted to 1000 c.c. and a small portion is compared with a standard solution in a colorimeter and the percentage which the patient secretes in the first and second hour respectively is estimated. From 60 to 80% is about normal for two hours, the remainder coming away gradually in the next few hours. As far as the kidney function for prostatectomy is concerned, if done properly, one can almost bank on this test. If it is low, say 20% for the first hour and 10% for the second hour, you may be sure your patient is in poor shape and needs pretty careful handling, for it is a danger signal not to be despised. Here, then, is where your treatment comes in. You

must decide on a one or two stage operation. If you decide on the former, you insert a catheter and leave it there; if you choose the latter, you open the bladder for drainage and take your chances. Certainly the removal of the prostate at this time is out of the question.

I believe that when you have instituted drainage, either one way or the other, that water by mouth is a great benefit. I force it to the limit, making the patient drink all he possibly can. It is by all means the best diuretic we have and washes out thoroughly the whole urinary tract.

In this connection, I wish also to draw your attention to a point which may be somewhat of a surprise, and that is in regard to infection of the bladder. I believe it is generally thought that an infection of the bladder is not to be desired. I am of the opinion that an infected bladder is an advantage rather than the reverse, *provided* the patient is going to be operated upon and that he has proper drainage. My reasons for this are these: If a patient has *sterile* urine, and you open his bladder either from above or below, it inevitably becomes infected. His body has then to work up a resistance against this infection at a time when it is very busy fighting shock. If, on the other hand, he has an infected bladder and gets proper drainage, he has his immunity already established before his operation and he can then devote all his energy to the resistance of shock and after effects of his operation. I have noticed over and over again, patients with great retention and infected urine, come safely through a primary operation, where one with less retention and less infection would have a stormy time or die in the struggle. Again, as I said a few minutes before, where you drained a case, either one way or the other, with large retention and uninfected urine, the sudden fall of blood pressure was very disquieting, whereas, the same procedure with large retention and *infected* urine was quite the reverse.

I also think, in preparing these patients, that if the Phthalein is in the danger zone, a blood urea estimation is an invaluable guide. This varies inversely with the Phthalein. If one is up, the other is down, and vice versa, because the Phthalein is, of course, secreted by the convoluted tubules. It is also very useful and, in fact, invaluable in cases which have had a former cystostomy and it is not easy or possible to obtain a proper Phthalein. In these cases a blood urea is a very safe guide and one you can depend on. Of course, then, the proper time at which to remove the prostate is determined by the response of our patient. As long as his Phthalein keeps going up, let him alone, and only interfere when it becomes stationary. If it does not go up, and the blood urea says you are safe, then go ahead without any fear. I think if these observations are respected, the majority of prostatectomies will be successful.

The kind of prostates with which you have to deal. This brings up the question of perineal versus supra-pubic prostatectomy, and it is not the purpose of this paper to discuss it, except as it applies here. It is undoubtedly conceded that the supra-pubic is the easier operation and with most men gives the best results. It generally, however, requires ether anæsthesia, with its attendant

dangers. It keeps the patient in bed much longer and one does not get such good drainage of the bladder, and it generally has to be done in two stages. The perineal is, on the other hand, a one-stage operation, has much less shock, can be done with gas, has better drainage, the patient can be up in a chair on the fourth day, which is a very great consideration in old men, and in cases where one suspects malignancy, it is preferable, as one may go ahead and remove as much as he thinks fit; this he certainly cannot do in a supra-pubic.

As I said before, I do not wish to go into the details of either operation. You are all more or less familiar with it any way, especially the supra-pubic. The perineal can only be properly demonstrated with lantern slides, and I am not prepared to present these to-night. I may say, however, that, in the perineal operation, one can remove a part or a whole as he wishes. In favorable cases of carcinoma a sub-total is done. This consists in removing the hypertrophied lobes and the posterior capsule as well. In other cases which are favorable, a complete radical can be done with good success and results. I know several patients, living and well, one as many as ten years after a complete radical perineal prostatectomy. In these cases the prostate is cut away from the posterior urethra, together with the neck of the bladder, part of the trigone, seminal vesicles, and upper ends of the vasa. The urethra is then united to the lower end of the bladder and retention catheter inserted for drainage for ten days. These patients do wonderfully well and the shock is nowhere as great as one would imagine.

The after treatment of supra-pubics consists in drainage with the original drainage tube, for about ten days, after which the stitches and tube are removed, and a small catheter inserted, this being attached to a suction pump. Personally, I use a suction bottle which is arranged to aspirate at the rate of about 70 drops per minute. This is exceedingly efficient and keeps the patient quite dry.

The bladder is irrigated daily with 1-40 boracic or 1-60000 bichloride. They should be placed on a Gatch frame early to prevent hypostatic congestion. We generally give them a Murphy drip of 5% Glucose and 5% Soda Bicarb. for 48 hours. Also an interstitial of normal saline immediately after operation. The bowels are moved on the second day and just as soon as possible we get them up in a wheel chair, even with the drainage tube in place.

In perineal cases, I insert a No. 36 perineal catheter with a large eye for drainage, and pack the capule cavity with gauze. The drainage tube runs through a hole in the centre of the mattress. An interstitial of normal saline is given immediately on return to the ward and Morphia P.R.N. as soon as necessary. Rest is a very essential thing in these cases. If they do not secrete, I give them an intravenous of 20% refined glucose solution. This usually starts the kidneys. As soon as the urine is free from blood, usually in 24 hours, the gauze is removed. In another hour, if there is no bleeding, the tube is removed and the bowels are opened at once with castor oil. No enemata are given under any circumstances for fear of fistula. They are allowed up on the fourth day, and the fistula is usually healed on the 21st day. Ordinary diet is given in both cases.

The prostate and its treatment is a very old subject. It dates back to the time when the early surgeons ran a knife in the perineum without even giving their patient an anæsthetic, but those times have changed. Surgery has kept pace with other sciences and to-day we can boast of a mortality of 4%. Seven years ago, Dr. Hugh Young, of Baltimore, under whom I studied for a year and a half, published the reports of 120 consecutive perineal prostatectomies without a death. Last winter I became well acquainted with an old doctor who was a patient of ours at Hopkins, and who had an enlarged prostate for years. I asked him why he had not had it removed before, and he replied that he had been waiting until we reduced the mortality. I thought he was very sensible at that. However, be that as it may, I know I have in this paper told you a good many things you already knew. It would be a difficult matter indeed to present a paper full of new material, but, if I have dropped a few points here and there which will be of benefit to any one present, in giving advice to any of their elderly patients suffering from the horrible malady which sooner or later may be awaiting any one of us, then I feel that I have been more than repaid for any effort I have made.

LIST OF LECTURES GIVEN TO THE HAMILTON MEDICAL SOCIETY BY MEMBERS OF THE STAFF OF THE FACULTY OF MEDICINE, UNIVERSITY OF TORONTO

April 9th	Professor Redfield	The Mechanism and Control of Respiration.
April 13th	do	do
April 16th	Professor Macleod	Chemistry of Respiration.
April 20th	Professor Hunter	Chemistry of the Blood.
April 23rd	do	do
April 27th	Professor Henderson	Cardiac Mechanism.
April 30th	do	do
May 4th	do	do
May 7th	Dr. Taylor	Peripheral Circulation.
May 11th	do	do

With reference to the above, Dr. J. E. Davey, President of the Hamilton Medical Society, says in part, "the course has proved to be of the highest value. About fifty per cent. of our membership signed up and were more than well repaid by the interesting, instructive and up-to-date presentation of the subjects discussed."

SYMPOSIUM ON TUBERCULOSIS*

The Scope of a Central Clinic for Chronic Pulmonary Diseases Working in Correlation with Research Laboratories.

A. H. W. Caulfeild, M.B., Toronto.

The chest and tuberculosis clinics in Toronto as regards pulmonary tuberculosis are chiefly concerned with:

(a) Cases referred for diagnosis, and, when this is positive, their disposal either as cases suitable for Sanatorium or for home treatment under the direction of the clinic.

(b) Cases on their return from Sanatoria for whom advice, treatment or direction may be needed from time to time.

The Public Health Nursing service co-operates with the clinics in arranging for Sanatorium treatment for those cases for whom this may be desirable, and for the follow up nursing work both as regards the patient and the contacts. Closer correlation between the Sanatorium and the clinics on even purely clinical grounds is greatly needed so that there will be no gap in the life of the patient without the needed direction, control or advice, and so that for both the Sanatoria and the clinics a continuous medical history will be available with the appearance of the patient at either the Sanatorium or the clinic. The administrative facilities of the Public Health service could probably best accomplish this, and in so doing would bring the activities of all three—Sanatoria, Public Health Nursing, and the clinics in closer touch. A simple plan could I think be easily evolved. This has been suggested to the M. O. H. and it is hoped that steps will shortly be taken to bring some simple workable plan into effect.

DIAGRAM OF THE SCOPE OF THE WORK.

A. Routine methods of investigating cases referred to clinic.

1. Clinical History. Physical examination. T.P.R.W. Records.
2. Quantitative Tbcln. Sensitiveness.
3. X-Ray work.
4. Blood examination for inhibitive and comp. fixation reactions.
5. Differential bacteriological examination of washed sputum.
6. Protein tests.

B. Specific inoculations—tuberculins, proteins, vaccines.

C. Induction of artificial pneumothorax, lung puncture, thoracic surgery.

D. Ward-bed observations.

N.B.—A-4 and 5 card indexed at Laboratory.
A-6 and B card indexed at Clinic.

Results of different methods of investigating cases available for final clinical opinion.

**Read before the Academy of Medicine, Toronto, Nov. 25, 1910, by Dr. A. H. W. Caulfeild, Dr. W. E. Ogden, Dr. F. S. Minns, Toronto, and Dr. F. H. Pratten, Byron, Ont.*

While this correlation is needed even for routine clinical purposes it is I feel of greater necessity if the patients while resident in Sanatoria are to enjoy to the full the additional methods of investigation such as can only be provided by a central clinic working in close relationship with a research laboratory. It is perhaps possible for most Sanatoria to have a fully equipped X-Ray department and an experienced radiologist but almost impossible for many to have a well equipped laboratory for serological and bacteriological work. And while this would hardly be justifiable still much of the value of a research laboratory in connection with a clinic might with little trouble and some organization be made available for the Sanatoria.

To illustrate this let me take up the lines of routine investigation which we have adopted at the clinic.

This is perhaps best illustrated by the diagram. Under the heading A. we have six routine methods of obtaining data. As these results are recorded in a few days after the first appearance of the patient the organization of the clinic is designed with the idea of bringing the desired data together in such fashion that the final opinion can be made with all the facts before one; usually this occurs at the time the stereoscopic plates, with the report from the X-Ray Department are ready for study by the clinician.

As regards No. 2 and 4 it is our desire at the clinic to record these three biological results in exactly the same fashion as one would at a clinical examination, record the presence of the various clinical findings. While it is not my purpose to-night to give a clinical interpretation of the different combinations of these biological data which may be found—nor the interpretation of these biological data when they change during the course of the diseases—I must say that I personally believe them to be so valuable that they should be available if at all possible, for they are of practical importance. However to demonstrate their value it is essential to record them on a number of cases continuously so that their variations will be demonstrated in connection with the variations of clinical progress incident to a large number of cases.

The doubts which our methods of investigation clinically and by X-Ray do not clear up vary with the individual case, but the greater number, upon whom we still need additional aid, which seemingly only some type of biological data can supply, fall into one or other of the following three classes.

1. Those in whom we suspect incipient tuberculosis—in whom the anatomical changes are minimal or questionable. These require a differentiation between Tuberculous disease and Tuberculous infection plus a symptom complex caused by such other conditions as a non-tuberculous focus of infection, a metabolic disturbance such as hyperthyroidism, or a neurological condition.

2. Those in whom the pulmonary lesion is easily demonstrated either by physical findings or by the X-Ray; here we desire to know if the bacillus tuberculosis is clinically active, either alone or in association with some non-tuberculous infection.

3. Those cases apparently arrested; can we get biological data which will correlate with the first effects of re-activation of the B. tuberculosis?

With some understanding on the part of the Sanatoria of the purpose of the laboratory work of the clinic it would be very easy to continue these observations at the Sanatoria on cases previously investigated at the clinic and again on their discharge from the Sanatoria to the clinic.

No. 5 and 6 are procedures for non-tuberculous pulmonary cases and can be dismissed in a few words. Although autogenous vaccines are at the present time practically demanded, very little has as yet been published in support of their value when one considers the extent to which this form of therapy is used. Our desire is to make the work of preparing autogenous vaccines the means of giving us more exact bacteriological data. To do this the bacteriological findings of the washed sputum are recorded for each case and a small amount of vaccine only prepared. If after 10 inoculations it is desired to continue the treatment another sample of sputum is examined bacteriologically. Thus the likelihood of the bacteria recorded being the real etiological agents, becomes increasingly probable with their re-appearance on subsequent examination.

This rule is I think of advantage to the patient and acts as a safeguard for the clinic and for the treatment; as well it promises bacteriological data of some value in that repeated observations on the bacteriological flora of washed sputum show variations or permanency for different individuals. The patients are advised before beginning vaccine therapy that their disease is chronic and that to get the full value of the treatment they should make up their mind to take short courses and that a year or more of this may be advisable. We are finding as a result that this provides the opportunity for the investigation of a number of points relative to the subject of immunity.

Protein tests; these must be available; the more one works with them the greater one feels is the need of as large a number as possible. The history does not always indicate the protein at fault. For technical reasons it is desirable to make the protein solutions for treatment freshly and not rely upon the commercial product. It is possible to carry on this work without a laboratory, but under the circumstances there are very distinct limitations to progress. It has been shown that protein sensitiveness is a phenomenon of clinical importance, but its full scope in bronchial asthma and other conditions is not fully demonstrated. Further investigation along both clinical and immunological lines is needed not only for academic but for practical reasons.

The 4 sets of card indexes—2 at the laboratory and 2 at the clinic give a ready access to the cases, upon which the different laboratory results have been obtained or which have been injected with the different biological preparations.

With a few rules of procedure and some slight organization which brings the laboratory workers both professional and technical to the clinic twice a week, these various methods can be carried out with ease and dispatch. This I should like to briefly illustrate.

The patient passes through the hands of the nurses, has a quantitative tuberculin test given by a laboratory technician and is then sent to the clinician, who, after making his clinical examination, may supplement by having any of the four additional methods of investigation carried out without further trouble, as follows:—

Blood withdrawal or protein tests on two days in the week and this can be done when the patient returns to have his tuberculin test recorded.

X-Ray work, as desired, or bacteriological examination of the washed sputum is arranged for by the nurse upon request of the clinician. The laboratory results are filed in the history and this usually takes place about the time that the stereoscopic plates with the description and interpretation by the radiologist is ready.

Protein, vaccine or tuberculin injections are given by a laboratory lay worker under simple directions whereby in case of doubt the patient is referred to the clinician. As a result dosage is carefully recorded and with the T.P.R.W. records can be seen at a glance by the clinician reviewing the case. This allows the clinic to handle a large number of cases carefully without an impossible demand upon the time of the professional staff.

Such a clinic needs beds in an observation ward. This is of course self-evident; it merely emphasizes the need of a knowledge of the whole field of internal medicine and thoracic surgery. But what is perhaps not conceded is that the specialist in pulmonary diseases wants to detail the methods of observation—this is a vague term and is often loosely applied—so that the observation will be a logical continuation of the work started in the clinic.

Under the heading C three procedures are mentioned which require what one might call surgical facilities. The first two are, however, done by certain members of the clinic and cases requiring more extensive work are referred to the surgeons. There are, however, a number of cases upon whom one hesitates to recommend surgical interference but for whom one can hold out very little promise by medical methods. It does seem that there is a comparatively large field here for experimental work and that this would develop more rapidly if a surgical division was incorporated with the clinic for both routine and experimental thoracic surgery. It is my hope that in a short while this additional field will be added to the scope of the clinic.

The need of clerical assistance for any clinic has become so definite that to be without it, handicaps the work enormously—and loads the clinician with work which is not properly his. The Public Health authorities, business corporations, and private practitioners should be notified of the results of the

examination. The public health of the community should be safeguarded by this means of communication.

I should like to give some figures to show that the expense of maintaining a clinic and laboratory in close correlation is cheaper than running them separately and that the volume of work turned out is not only greater, but better. It is impossible to do this, as the present situation is unsettled, and has resulted from changing circumstances. About eighteen months ago the Connaught Antitoxin Laboratories agreed that chronic pulmonary diseases afforded a legitimate field for research in the field of preventive medicine, and accordingly work was instituted, obtaining the clinical material for investigation from the combined Chest Clinic at the Toronto General Hospital and the other teaching hospitals. About nine months ago this was enlarged by increasing the laboratory workers and the clinicians so that D. S. C. R. patients could be examined.

Lately the civilian clinic at the Toronto General Hospital has been changed to one for tuberculosis only so that the personnel has been changed from time to time to meet these conditions and it is impossible to contrast the patient attendance with the number of clinicians required and with the number of laboratory workers needed to carry on the laboratory routine without embarrassing the research in hand.

Before these changes began to manifest themselves in the attendance the combined civilian and D.S.C.R. clinic steadily rose to an attendance of 89 on one afternoon without hindering the two activities of the laboratory, namely the research in hand and the established routine.

I wish here to acknowledge my appreciation of the support given by the Department of Soldiers' Civil Re-establishment in allowing me as chest consultant to develop the laboratory as an integral part of the clinic, and to have both under the same direction. This for the Government is economy in the end, because a laboratory had to be established for certain simple procedures which nevertheless required care and expertness; and by the slightly increased expenditure the clinic immediately benefited so that on doubtful cases one had all the data which bacteriological and serological work could afford. This as well infused my colleagues in both the clinic and in the laboratory with a keenness which I do not think could otherwise have been obtained.

If, through the timely warning given by the results of serological work but a few "apparently arrests" cases of Pulmonary Tuberculosis can be so directed that a breakdown is prevented the saving for the Government—by the difference between a 100% and a 25% or less pension—will more than equalize this increased expenditure; and the country will benefit by fewer helpless consumptives and have instead producing citizens. This is but one of the practical advantages which I believe can be proven.

IN CONCLUSION.

I have endeavored to show diagramatically the various facilities which I believe should be at the disposal of a fully equipped clinic for chronic pulmonary diseases. This necessitates close co-operative work between the clinician, the laboratory worker and the radiologist and should include available ward beds and the development of thoracic surgery. We have proved that with a little care in the organization it is possible to have the results of these methods of examination and investigation available in a few days so that as a routine a final opinion may be based upon all the data—clinical, laboratory and roentgenological; that such a clinic can with advantage be used as a reference clinic for other of the chest clinics in Toronto.

It is suggested that closer relationship should be established between the city's chest clinics and the Sanatoria preferably through the agency of the Public Health services, and that certain of the laboratory facilities of the central clinic should be extended to the Sanatoria.

NEED AND CORRELATION OF SANATORIA NEAR TORONTO FOR NON-TUBERCULOUS PULMONARY DISEASES

W. E. Ogden, M.B., Toronto.

The Associated Tuberculosis Clinics of Toronto, comprising those of the 4 teaching hospitals of the City, about a year or more ago arranged with the D.P.H. to see and treat at the Clinics any case with symptoms suggesting any chronic Pulmonary disease. There had been no direct Public Health Department effort to handle such cases, nor were there regularly established Hospital Clinics for this purpose. At this time also, all the facilities of a laboratory, ready to take on investigation work of all kinds in reference to respiratory diseases were offered us through (Dr. Caulfeild) one of our members, who at that time, had commenced his own Clinic for non-tuberculous pulmonary diseases. This arrangement was made with the hospitals and the D.P.H. and we had the co-operation of all, including the P.H. nurses. It had been observed that pulmonary cases for differential diagnosis, had for years been referred to us to diagnose or exclude tuberculosis and that we frequently had such non-tuberculous cases to investigate and dispose of. The methods, clinical and laboratory, are the same for one as for the other in the matter of diagnosis. As a matter of fact the methods in the matter of treatment are not dissimilar, and as we had these at hand it seemed most logical that ours were the Clinics to carry on both the tuberculous and non-tuberculous.

The long series of that most monotonous and discouraging type, the chronic bronchitis and emphysema, the asthma, the chronic pleurisies, the bronchiectasis, the hay fever, had for the past century, been written up in medical books with much the same numerous suggestions for treatment—always ending with "a change of climate and surroundings, etc., etc." Now they began to sort themselves out into more definite shapes. With such improvement in the methods of investigation as have been made in the last several years in X-Ray films of the teeth, stereo Roentgenograms and fluoroscopes of the chest, proteins tests, bacteriology of the expectoration and discharges, and of pus and fluid obtained more frequently by the use of the long needle,—with these improvements, I say, we are enabled to put together a group of symptoms and findings, and to work out a more definite pattern, we can comprehend better the symptom complex as it varies even slightly in the different types of chest conditions. Our comprehension of them is not so vague and we are less inclined to scribble "Recipe—Ipecac and Squills, Creosote or Tinct. Camph. Co." We are more inclined to look, and look again and elsewhere for some other underlying cause

than heredity, etc. With the help of the X-Ray, the laboratory, the dental surgeon, the Nose and Throat expert, we frequently find other foci of infection which may prove direct factors. And so we are reminded of an old bit of truth, "that there are more mistakes made in medicine from not looking, than from not knowing," and we are rewarded. New interest is added. I wish to repeat that much new interest appears. The Clinic for these old chronics is no longer the drudgery, no longer the monotony of writing "Repetatur" or as has been, and is so often yet done, in the large City hospitals of London, the abbreviation "Rep" "Rep."

Now there are four groups of these non-tuberculous pulmonary cases as we now have them.

Firstly—The group which after investigation and clinical, surgical or laboratory treatment, make definite and steady improvement while carrying on their work or remaining at home and attending the Clinic.

Secondly—The group which are so debilitated that a change is indicated from the responsibilities and confinement of City homes, to the more care-free, hygienic and regular living in a Country Institution.

Thirdly—A group for which is needed more careful daily clinical and laboratory observation in an Institution.

And perhaps fourthly, a group of more or less permanent invalids which some day will diminish by not being added to. I say "will diminish" advisedly as we are convinced that more and more we are saving patients in the earlier stages from advancing to the chronic fibrosis and emphysema, the debilitated asthma, the purulent and stinking bronchiectasis.

The second group of non-tuberculous cases just named, are, in vulgar but truly descriptive phraseology, "all dressed up and nowhere to go." Case after case, gentlemen, appears before us week after week at our clinics and in all seriousness cries out for non-tuberculous Sanatorium treatment. There isn't a week passes without my saying to some patient private or P.H., "I almost wish you had only incipient tuberculosis instead of ordinary chronic bronchitis or bronchiectasis." This attitude for two reasons, there are well established Sanatoria with every facility for early tuberculosis, and also because of these facilities for tuberculosis, one can sometimes more safely promise a cure in early tuberculosis, than in established bronchitis or asthma, etc.

EXAMPLES OF CASES FOR INVESTIGATION OR TREATMENT OR BOTH, AT NON-TUBERCULOSIS SANATORIA

Case 1.

M C., girl of 29, referred to me by Nose and Throat Physician four years ago, had been through four Nose and Throat Specialists' hands previously, receiving treatment for nasal polypi. Loose cough 19 years now, gradually worse, very troublesome 6 years, tires easily, other symptoms of toxic absorption.

Two years ago developing swollen and painful wrists and knees, sent to a tuberculosis Sanatorium because there was no other, and improved considerably for four months, going from 118 to 130 lbs. and getting on exercise. Returned and had intestinal short-circuiting operation for intestinal stasis as possibly the holding factor. No real improvement. One to two oz. thick and occasionally foul sputum daily. Helped very much by autogenous vaccine, but far from cured. Diagnosis, bronchiectasis with complications.

Case 2.

Wm. R., man of 34 years, "bronchitis" 24 years, 3 oz. purulent, foul sputum daily, several frank hæmoptyses of several oz. Came to me 1915. Considerable improvement with autogenous vaccine. Unwilling to submit to stigma of tuberculosis Sanatorium. Diagnosis, Bronchiectasis.

Case 3.

L. G. R., man of 44. Two years ago came with 1 oz. thick yellow expectoration, once 1 drachm pure blood, marked malaise, fatigue, unable to attend to any office management of financial business. Bacteriological findings, staphylococcus viradans and later staphylo and streptococci. Took autogenous vaccine, four months in Muskoka District, eight months in Southern States, four months again in Muskoka and is again at business. Diagnosis, right mid and lower lobe bronchitis, with possibly bronchiectasis.

Case 4.

G. H. McL., man of 43, physician. Pneumonia March, 1919, since then slight cough, very little phlegm usually, now less than one drachm, tires very easily on any exercise. Limited area impaired resonance below the angle of right scapula and few small rhonchi here. Stereo plates indicate only slight suspicion of tuberculosis in R. apex (few minute clusters), and possibly right and left hilus; interlobar pleura between right mid and lower lobe thickened. Diagnosis, debility following pneumonia. Caulfeild's Inhibitive reaction here gave I ii and was moderately marked with negative fixation to T.B. antigens. Tubercle is a probable factor.

Case 5.

J. M., stereos No. 59865, T. G. H. Signs of bronchitis in May. In August septic fever, and sick, with marked dullness lower left posterior chest. I failed to reach pus with the needle. A surgeon put one through the diaphragm and found a subphrenic abscess, then operated at once and drained several oz. of pus. Man up and about a little, but weak and very pale. Case for non-tuberculous institution, under observation. At present no basal expansion on the left, few rhonchi and some impairment.

Case 6.

Mrs. C. K., age 24, came to chest clinic T.W.H., June, 1916. Cough, phlegm, weakness, flatulence, sweats, always tired, dyspnœa on slight exertion, weight

82½ lbs. H.K.W. 108, usual 100. Went to tuberculosis sanatorium for 9 weeks, gained 14 pounds. After returning home lost all she had gained in one month. Was constipated and I am sure careless in her eating. Was helped temporarily with autogenous and stock vaccine. X-Rays taken. Further observation in institution would be of value. Is living a rather miserable life at home. Frequent attacks of coughing and weak spells. Provisional diagnosis, asthma.

I very well remember my own attack of phthisophobia. When I ventured to visit the Muskoka Sanatorium in 1908, to apply for a position on the staff, the physician-in-chief was questioned as to the danger of my acquiring the disease while attending the patients. I had the still prevalent fear and prejudice. Later, after working with the disease for three years, I was dictating to a stenographer patient a letter to the Toronto M.O.H. approving of his new regulations for registering tuberculosis, and I stopped to ask the stenographer's opinion. She said in all sincerity that if her physician registered her she would shoot him. I mean by this to recognize that the fear (and perhaps prejudice) of consumption is yet a very real factor, and although lessening to some extent, will probably always be a factor. Actually I was refused life insurance by two well-known companies, the Canada Life and one other, for no other reason than that I lived at a sanatorium for tuberculosis at that time.

So that besides the difficulty in persuading non-tuberculous lung cases to go to a tuberculosis institution, there is a conviction which has recently been strengthened in my mind, viz., that unless we are reasonably positive of tubercle being *the* factor, we may make a very serious mistake, we may do actual harm in one way or another by labelling the case tuberculous or even a tuberculosis suspect. It is commonly accepted that a case must be called tuberculosis before admission to a sanatorium can be obtained. At this time, gentlemen, a legal case is pending where two insurance payments of $10,000 each to the widow are refused by two large companies, because it was found that a physician had suspected tuberculosis five years before the death. The patient died of influenza.

With many cases presenting problems such as these detailed above, I must declare a noteworthy contrast between the interest in working at a clinic without laboratory, X-Ray and other facilities, and the interest and stimulus which is added when we have these aids at hand, and where consultations are held and the various aspects presented. The contrast is, I think, greater than that between handling a fracture without X-Rays and handling one with X-Rays. As to results, there is nothing quite so fruitless and discouraging for patient and physician than a custom still followed, though to a lesser extent than previously, of advising in a vague way California and the like, without seeing that the patient does not locate in some hotel or boarding house quite away from clinical supervision and the facilities for checking progress, complications, or retrogression.

Nor can I avoid mentioning our experience in Army Medical work, particularly our efforts to have important observations and findings follow the patient.

In very many places excellent and thorough work was done. When reports of this followed down to the end hospital, it was most satisfactory and encouraging, and when such good reports were fyled away and did not follow, it was most discouraging, and we felt good work and time was lost. When, for example, Major Pratten's reports came through from Moore Barracks, or Lenham, to us in Toronto we were happy; when, on the contrary, we found no evidence of tubercle and when without any history Col. Elliott had to change a diagnosis of a case with hæmorrhages from tuberculosis to bronchietasis, we were at sea as to whether tubercle had ever been a factor. Other cases arrived, diagnosed tuberculous and in which no present trace by any method could be found. Major Pratten's letter explained this, that under the extraordinary circumstances of changing the surroundings of a man sick with tuberculosis from the trenches to a sanatorium, progress was so marked that in two or three months, I think he said, one would hardly credit the former tuberculosis.

SUMMARY.

1. The need, therefore, of an institution for non-tuberculous pulmonary cases is obvious.

2. It should be out of the city, and whether 10 or 50 miles, and as to location, might well depend on a climatologist such as Dr. Elliott.

3. Correlation in all phases of investigation and treatment should be provided for, along some such lines as outlined by Dr. Caulfeild in regard to our daily Chest Clinic at the Toronto General Hospital.

CORRELATION OF OUTLYING SANATORIA TO SUCH A CENTRAL CLINIC . .

F. H. Pratten, M.B., Byron, Ontario.

Mr. Chairman and Gentlemen:—

It is with pleasure that I respond to an invitation to supplement Dr. Caulfeild's very able paper with a summary of my views on the correlation of outlying Sanatoria to such a central clinic as he has spoken of.

In dealing with this subject it seems to me it would be advisable to consider the subject under three headings:

(1) Prior to admission of patient;

(2) While in residence; and

(3) After discharge.

Dealing with the first heading, I might say that in our Sanatorium, and I believe such is the case in others, we feel that many of our patients are non-tuberculous, but have pulmonary complications and have been sent to our institution. It is not necessary for me to point out to this meeting why such a procedure is distasteful, both from the standpoint of the patient and of the sanatorium; as far as the patient is concerned, when once he is admitted to such an institution he is more or less labelled for the balance of his life, not to mention the inconvenience to him, and the loss of time, and the occupancy of a bed in the institution which might be filled by a case requiring treatment, and, from the point of view of the Sanatorium, it is rather awkward, to say the least, to be obliged to change the diagnosis when a patient has been sent in in good faith. This is where a central clinic would be of invaluable assistance in determining a positive diagnosis. As Dr. Caulfeild has ably outlined, it is possible for such a clinic to have facilities practically unattainable for those of us who are in charge of institutions. At the Queen Alexandra we are fortunate in having an X-Ray equipment and a fairly fully equipped laboratory, but there are other sanatoria not so fortunately situated, and even with us it would be a very expensive undertaking to obtain the services of a pathologist sufficiently conversant with the routine peculiar to the subject of tuberculosis. At this central clinic, for the purpose of diagnosis, there are available facilities, as outlined in Dr. Caulfeild's paper, for X-Ray examinations, tuberculin tests, blood examinations, clinicians' observations, repeated sputum analyses, and, if necessary, pulse, temperature and respiration record for a short period, all of which assist the clinician in arriving at a definite diagnosis before recommending the admission of a

patient to a sanatorium. It is obvious that had the non-tuberculous patients now in our sanatoria passed through such a central clinic, their admission would have been prevented. On the other hand, as conditions are at present, these patients, on provocation of the slightest chest symptoms, are loaded on our institutions, and when admitted are labelled and considered and treated as subjects of tuberculosis until found to be non-tuberculous, which requires considerable time and work.

Dr. Caulfeild has mentioned in his paper that in his opinion it would be advisable to have an observation ward. This I thoroughly concur in, as minute observation is essential in arriving at a definite diagnosis in certain cases.

Dealing with my second heading, as intimated above it is a fact that many of our patients now in residence in our sanatoria are non-tuberculous. Since they have been sent there as being cases of pulmonary tuberculosis one is reluctant about discharging them as non-tuberculous without a full investigation, as outlined above. It is necessary, therefore, to devote considerable energy and time to the confirmation or otherwise of the initial diagnosis, which could have been determined by such a central clinic. Facilities for this work are not available in most of our sanatoria, yet it is absolutely essential that this work should be done before deciding definitely that the patient should or should not remain in our institution. If it is determined that the patient is non-tuberculous it places both him and the sanatorium in a most unfortunate position, the patient because by his residence in a tuberculosis sanatorium he has been labelled as a consumptive, and the institution because, although the patient has been sent there in good faith as a positive case, it is necessary to discharge him as otherwise.

On the other hand, in the case of the patient who is in residence and whose diagnosis is confirmed, it is not uncommon to find that he would benefit by special treatments of autogenous vaccines, tuberculin and so on; such preparations could readily be obtained from the central clinic when the proper facilities are not available in the institution.

Lastly, dealing with the problem of the patient on his discharge, there is an expression "When once tuberculous, always tuberculous." When a patient is discharged from a sanatorium he requires further observation, if not further treatment. This is essential from both a physical and psychological standpoint. Here again it would be advantageous for the patient to be able to report to a central clinic for re-examination from time to time, and if his physical condition was found to be retrogressive this fact would be determined and the patient returned to the sanatorium. Then there is the patient whose physical condition remains stationary or progressive, but who, from a psychological standpoint, requires periodical examinations. This type of patient would be greatly benefited by the favorable report of a central clinic.

I have endeavored to review briefly the benefits that a patient might derive from such a central clinic. In addition, a minor but very important factor in favor of such a central clinic would be the training by it of lay technicians whose services would be very valuable in our laboratories. These technicians, having had their training in the central clinic, could link up the laboratory work of the different sanatoria under the supervision of those in charge of the central clinic. This, in my opinion, is a most important point, inasmuch as it is most difficult to obtain the services of those who have had special training in this work.

When asked by Dr. Caulfeild to have something to say on this subject, I had hoped to be able to have some statistics as to the number of patients in the Queen Alexandra Sanatorium who, in my opinion, are non-tuberculous, and as to whether or not they had passed through such a clinic. I regret to say that owing to many unforeseen difficulties, and insufficient time for preparation, I have been prevented from preparing these statistics, which I think would have impressed more forcibly the important points of my previous remarks.

To summarize, in my opinion there are patients in our sanatoria who are non-tuberculous, and whose presence there could and would have been prevented had such a central clinic been available, thus eliminating both the inconvenience and loss of time sustained by the patient, as well as the expense incidental to his treatment and maintenance in any of our institutions.

CORRELATION OF CLINIC FOR TUBERCULOSIS IN CHILDREN

F. S. Minns, M.B., Toronto

While this phase of the subject is the last on the program for discussion, I am sure you will agree with me it is not the least in importance. Many diseases have their beginning in childhood. This is more true of tuberculosis than of most other diseases. In the light of modern views on tuberculous infection and disease, it must be evident that any organization to aid or advance the present forces in the field fighting tuberculosis must necessarily include a clinic for children. The first step is the diagnosis. The first diagnosis should be made of the first incipient condition occurring in the child.

Every sanitarium physician comes to realize sooner or later that to combat the spread of tuberculosis and successfully treat the disease most of the work must be done in the home, not in the hospital or the sanitarium. The home must be the unit, a tuberculous individual is only a part of that unit. The child is really the most important part of the unit. The chest clinic at the H. S. C. began work in November of 1911; and since then it has examined 3,841 children, and treated thousands of cases. The policy of the clinic has been to examine every child in the house or home where tuberculous infection is present, and every child that is a suspect case. Treatment has followed, both for the tuberculous and non-tuberculous conditions found; and where possible the tuberculous cases have been kept under observation since their first appearance.

A child is not a little man, and can not be dealt with as such. The diagnosis of tuberculosis in the child is different from that in an adult and just as difficult. The conditions are different, the difficulties many, and the problems to be solved diverse.

In Framingham, Massachusetts, a most intensive community study of tuberculosis has been carried on for the past three years with a view to determining the best measures for the eradication or at least the control of the disease. The best experts in America, the Federal, State and local organizations; the health, educational and professional interests; religious, business and labour associations have all co-operated; and recently the Committee on Appraisal of the National Association reports:

"The Demonstration has not furnished an answer to the primary question as to the practicability of the control of tuberculosis, because the period of three years was necessarily too short to make a conclusive answer to this question possible. The results thus far obtained are as promising as could be expected:

but an extension of the work for a period of five years more will be necessary in order to insure, with reasonable certainty, a satisfactory answer to this question."

The point I wish to make here is, that it requires about ten years to acquire a knowledge of tuberculosis. Now, we have many men in this particular field of medicine who have this time qualification. They have learned much about tuberculosis and are prepared to go forward. They are competent to make a physical examination and to treat a cough; but it would appear to be an opportune time to do more, and some constructive organization is required.

The need of the hour is an organization that has within its scope the observation of the different parts of the home-unit, those of all ages, at all ages, and for all time.

There are exceptional opportunities for special research in connection with tuberculosis, along such lines as the accumulation of an extensive series of radiographs of contact cases: the study of nutrition as a predisposing factor: the prolonged observation of changing or constant bacteriological and serological findings in association with the varying clinical pictures.

If this work is to be carried to its logical conclusion, it behooves us to begin with the child and so to correlate all the organizations as to get a connected whole.

There are many advantages that would necessarily follow: the patient would benefit from the routine and special investigations: the public would be further safeguarded: physicians and surgeons, alike, would be assisted by the knowledge derived therefrom, if the facilities of such an organization were as available and efficient as the services of the Provincial Health Department is in reference to Syphilis.

DISCUSSION.

The discussion was opened by Dr. Parfitt of Gravenhurst. He demonstrated that approximately one-sixth of the number of patients arriving at sanatoria were non-tuberculous, and that while not all of these could be eliminated by a central clinic, still the possibilities of such a central clinic to the sanatoria as an aid to diagnosis and as an aid to the smaller laboratories of the sanatoria, would be wide. He dealt at some length with the possibilities of the complement fixation tests, from the aspect of treatment, which work could only be done at a central laboratory.

Dr. J. H. Elliott emphasized the points brought out by the previous speakers.

Dr. J. H. Holbrook urged the need of Provincial aid in an effort to combat the disease, both in a financial and an executive way.

Dr. J. G. Fitzgerald suggested the possibilities of extending the field of work done by the Connaught Laboratories to the D.S.C.R. and the outlying sanatoria generally.

Dr. C. J. O. Hastings expressed the need for an extension of the tuberculosis work in the Dept. of Public Health, Toronto, and the difficulty of getting funds necessary to carry on this work.

Current Medical Literature

THE TREATMENT OF ENLARGED OR DISEASED TONSILS IN CASES WHERE SURGICAL PROCEDURES ARE CONTRA-INDICATED

IRWIN MOORE, M.B.

Jour. Laryngology, Rhinology and Otology, Vol. XXXLV., No. 10, October, 1919.

In this paper, read at the summer congress of the Laryngological Section of the Royal Society of Medicine, the author thoroughly covers the tonsil question. The diversity of views on the question of operative removal is pointed out, and in view of such differences he considers that the time has now arrived when a review of the situation from an unbiased point of view may well be considered. This includes a consideration as to whether too much operating is really done, and if any satisfactory non-surgical procedure offers itself for those cases in which serious affections of the general health accompany the general disease. The author first considers those conditions in which surgical procedures are contra-indicated, and in some cases a positive danger, discusses the various non-surgical remedies which from time to time have been advocated, and draws special attention to those methods of treatment by which the enlarged tonsil may be satisfactorily treated. He revives a long overlooked and discarded method, and hopes to reinstall it in its proper place, viz.: as a substitute and as the treatment of choice in certain cases in which radical operation is contra-indicated. This is *soda cum calce* (London paste), analogous to Vienna paste, but possessing many advantages over the potassium combination. In 1864 Morrell Mackenzie introduced the sodium combination and named it London Paste. It consists of equal parts of caustic soda and hydrated lime mixed with a little alcohol. Its advantages over the Vienna Paste are as follows:

1. It causes no inflammatory re-action.

2. It penetrates rather than spreads circumferentially, therefore its application is more localized and the surrounding parts are not affected.

3. Its action is less severe and continues for a much longer time.

4. It causes much less pain, in fact, is painless when cocaine is first applied.

5. There is no hæmorrhage.

6. There is no rise of temperature, no risk of sepsis and no bad symptoms ever followed its use.

7. It may be employed in very young children.

8. Its special advantage over other caustics is that it is only necessary to keep it in contact with the hypertrophied tonsil for five seconds.

The author's results in using this paste in cases ranging from childhood to advanced age have been most striking and of a very permanent character. In this he confirms the initial experience of Morrell Mackenzie, who cited 40 cases in 1864 of not only acute and chronic enlargement, but tonsils with septic crypts to eight.

Preparation of the paste.

Equal parts of finely pulverized and well mixed caustic soda and unslaked lime are kept in a well-stoppered bottle. These caustics have a powerful affinity for carbonic acid and if exposed to the air become inert. A little of the powder is placed on a porcelain slab, a few drops of absolute alcohol added, and the two carefully mixed with a spatula. A proper subsistency is important, since if it is too thin it is apt to run to parts one does not wish to cauterize, or if too lumpy it will not stick and bits may come off and be swallowed.

It is probable that this latter was the cause of the method becoming obsolete and forgotten. Cocaine, too, has since been introduced.

Application of the paste.

It is only necessary to apply the paste for a few seconds, as its action is very rapid. The mucous membrane almost invariably assumes a bright red color, followed by streaks and patches of dark blackish blood. The following day the tonsil is covered by a whitish-yellow slough. The paste should be re-applied after an interval of three or four days, and then twice a week. The number of applications varies according to the size of the tonsil and the amount of fibrous tissue present; usually two to eight applications suffice.

This escharotic not only actually destroys in successive layers a portion of the tissue by a process of disintegration, but also devitalizes a subjacent layer, causing it to become soft and friable. During the devitalizing process, the tonsil also undergoes general shinkage. The largest tonsils have been reduced to normal size, whilst in cases of diseased tonsils there has been no blocking or sealing up of septic crypts, as may occur with the galvano-cautery.

It is a consulting room procedure devoid of pain or bleeding, the local application of cocaine to the tonsil alone being required.

Moore has had an applicator made, consisting of an oval saucer-shaped receptacle attached to a handle which facilitates rapid and safe application of the paste.

In these days when the removal of tonsils has become almost a disease with many specialists, it is refreshing and a hopeful sign of surgical progress to have papers presented pointing out some of the evils of promiscuous surgery and some of the simpler (and saner) measures which relieve the patient of his complaints. Irwin Moore does not take the ground that operative removal is never indicated; he very timely draws to the attention of the profession, that there are many conditions in which operative treatment is not wise or desirable, and in these cases other efficient means are available.

AN INTRA-TRACHEAL TUMOUR REMOVED BY PERORAL TRACHEOSCOPY

HERBERT TILLEY, F.R.C.S.

Jour. Laryngology, Rhinology and Otology, Vol. XXXV., No. 1, January, 1920.

This exceedingly interesting and rare case, which Mr. Tilley has so graphically described, stands almost alone in laryngological literature, only one other case, with similar clinical symptoms, having been reported, viz.: "Endothelioma of the Right Bronchus Removed by Peroral Bronchosocopy." (Chevalier Jackson, American Laryngological Association, May, 1916.)

A healthy, active officer fell a victim to mustard gas on March 21st, 1918. He was in bed for fourteen days and then invalided to England. His only complaint then was a sense of difficulty in breathing on exertion and pulse rate increased by 50%. Six months later he was acting as "gas instructor," but had to give it up owing to dysnœa, rapid heart action and occasional spitting of blood. He was demobilized as C1 and 20% disability, though still dysnœic on exertion in January, 1919. In April and May of the same year he had stridor on walking, much yellow sputum and breathed like an old emphysematous man.

In June the stridor was more marked, he was bent over like an old man, and coughed for nearly half an hour on lying down. There was no cyanosis, but recession of both supra clavicular fossæ was present, and the breath sounds over the root of the right lung were feeble when compared with the left. Urinalysis, specific gravity 1021, heavy trace of albumen, no sugar, few hyaline, granular and epithelial casts, numerous decolorized blood discs and a few leucocytes. Examination of the sputum showed a moderate amount of pus, numerous blood cells and a few squames; no tubercle bacilli, but numerous other organisms, chiefly coliform bacilli, M. catarrhalis, streptococci. Radiographic reports evidence of some infiltration of the mediastinal contents at the level of the manubrium sterni, which results in pressure on the trachea and œsophagus, but there is no evidence as to the nature of the infiltration or of any other lesion of the lung or aorta.

Mr. Tilley now saw the case (fifteen months after being gassed). The patient had a noticeable stridor on even the slight exertion following walking across the room, otherwise he appeared to be a strong, well-built man. The vocal cords were normal in action and colour. By making the patient stoop a little while he knelt before him in order to examine the trachea, Tilley saw its lower end almost occluded by a pale reddish grey tumor, which moved upward and downward on expiration and inspiration. It was obviously attached to the

right side, and close to the opening of the right bronchus. Operation was carried out the same evening. Open ether had to be discontinued owing to the cyanosis produced, and chloroform was substituted. A portion of the growth was grasped with forceps passed through a full size bronchoscope. Free bleeding ensued, which, running down the bronchi and being coughed up, rendered the completion of the operation very difficult. The use of the direct air pressure apparatus by the anæsthetist made the completion of the operation possible. As soon as he was able to secure the pedicle with the remaining portion of the tumour, all bleeding ceased. Tilley says the forty minutes of this operation was the most anxious time in his surgical career. The patient rapidly recovered and left the nursing home on the fourth day. Three months later there was no sign of recurrence, and the patient was quite well.

The author suggests that possibly the gas had caused a localized ulceration of the trachea, and the granulations forming on this had assumed the formation of a tumour, which had become pedunculated owing to the traction and propulsive influences of the inspiratory and expiratory currents of air.

Professor Shattock, to whom the specimen was sent, classed it as a papillary granuloma, and its pathogenesis was probably as surmised by Mr. Tilley.

The author emphasizes the value of the stooping position of the patient when one is endeavouring to examine the lower region of the trachea with the laryngeal mirror. He cites another case in which he was able by this means to see the lower end of the trachea bulging inwards on the left side in a patient suffering from difficulty in breathing. Radiographic examination demonstrated an aortic aneurism.

DIATHERMY

Norman Patterson, F.R.C.S.

The Lancet, No. 5323, Vol. cxcvii., Dec. 6th, 1919.

Though the use of Diathermy has been carried out in England since 1910, there is very little general recognition of its value. By its employment the treatment of epithelioma of the mouth and pharynx has been entirely revolutionized, and the author, from a considerable experience during the last five years, has come to the conclusion that in the bucco-pharyngeal cavity it ought to entirely supersede cutting operations. Unfamiliarity and prejudice, together with the costly and somewhat cumbersome apparatus necessary, seems to account for the lack of its more universal adoption. The apparatus produces a high frequency current which reverses its direction at the enormous rate of perhaps 100,000 times per second. One electrode is placed over the skin of the chest or abdomen, while the other takes the form of a needle, narrow spatula or button. The handle is insulated and the operator wears rubber gloves.

Owing to the resistance offered to the passage of the current, heat is produced and the albumen present in the tissues is coagulated. Coagulation passes for a considerable distance beyond the electrode. When using an ordinary cautery point, destruction is limited to the immediate neighborhood and the all-important effect of penetration is lost.

The main advantages over cutting methods are as follows:

1. Bleeding lessened in nearly all cases, but if the severed vessels are large, hæmorrhage may require the clamp and diathermy again used on the proximal end. This is better than ligature. Secondary hæmorrhages may, however, occur when the slough separates. (2) Total destruction of the tissues in the neighborhood of the terminal and the impossibility of cell implantation. (3) Sterilization of the parts. (4) Structures some distance from the electrode are destroyed, depending on the size of the electrode, strength of the current and the character of the tissues. Here lies its great advantage over excision with the knife. (5) Vascular structures situated in the area of destruction are sealed up, so that absorption of bacteria and toxins is less likely to take place. The absence of marked inflammatory reaction and elevation of temperature is thus explained. (6) Shock is much lessened, probably owing to the "cooking" of the nerve filaments encountered. (7) Ease of re-application when recurrence of the tumour manifests itself. (8) The denser and more extensive scarring acts as a barrier to the spread of malignant disease. (9) Ease with

which epithelioma of the base of the tongue, palate, tonsils, epiglottis, arytenoepiglotidean folds and floor of the mouth may be dealt with per vias naturalis, as against the extensive neck dissection a cutting operation entails. (10) Applicability to the old and feeble particularly as several sittings may be given. (11) The growth is practically always approached from the surface of origin—the mucous membrane. The removal of the cervical gland takes place in all cases some three or four weeks after the diathermy operation on the primary growth. In cases of malignant disease of the floor of the mouth, the structures may in the "cooking" process have "run together" so much that the dissection is rendered very difficult, the patient's consent to a subsequent neck operation should always be obtained.

Subsequent treatment consists in keeping the cavity (i.e., the mouth) as clean as possible with mild antiseptics and assisting the patient in his swallowing difficulties by special food preparations; even feeding through a tube passed through the nose or by Hill's œsophageal tube. Hæmorrhage is dealt with along general surgical lines, but may be oftentimes avoided by ligation of the main blood supply before the use of the cautery. Pain is not a marked feature during convalescence and frequently is not of much account for ten days or more, when it is sometimes severe and is then treated on general principles. Septic pneumonia is rare, wonderfully so considering its frequency in large operations on the mouth and deeper parts of the pharynx. Cervical adenitis is common, but soon subsides.

The author's results have been very encouraging and he dissents very strongly from the view some surgeons take, that the method is palliative only and should be reserved for "inoperable cases." He says that "no incision of a carcinomatous growth in the mouth or pharynx, however small that growth may be, should be carried out with the knife if diathermy is available."

A microscopic examination of the suspected tissue will generally settle the diagnosis. A positive Wasserman, and the blood is frequently positive, should not delay immediate operation.

PERRY GOLDSMITH.

Abstracts

MEDICINE.

Abscesses Caused by Typhoid Bacilli.

F. Rathery and Bonnard (*Bull. et Mém. Soc. Méd. des Hôp. de Paris*, March 4th, 1920) report two cases of severe typhoid fever in which abscesses containing typhoid bacilli appeared in convalescence at the site of a previous trauma—an operation scar in one case and a fixation abscess in the other. The time which elapsed between the trauma and the development of the abscess was twenty-one days in the operation case and twenty-seven days in the other. In the subsequent discussion Widal also reported three cases of abscesses containing typhoid bacilli which developed during convalescence from typhoid fever —in the first case at the site of injections of caffeine and normal saline, in the second near a tuberculous gland, and in the third in an ovarian cyst.

Mental Disorders Associated with Old Age.

Savage (*Journ. of Mental and Nerv. Dis.*, March, 1920) deals with the clinical aspects of mental disorders associated with old age, and their possible complications. The term "denudation" is used to illustrate the loss of memory for recent events which occurs very commonly in old age; the author shows that though a patient may be deficient in recent memory, he may be quite capable of realizing the extent and value of his property, and of giving instructions for its disposal. Loss of control occurs as the higher cerebral centres cease to function and the lower react too vigorously; this is very evident in the restlessness of old age. A familiar example is the old lady who is never satisfied with the tidiness of the house, but constantly rearranges the ornaments and dusts the rooms. Men, on the other hand, often develop grandiose ideas, and launch into extravagant schemes of business, or enter into marriage for a second or third time. Loss of higher control, leading to a feeling of well-being and of sexual potency, causes many old men to form associations with loose women, or to behave indecently towards young girls or boys; it is of considerable medico-legal importance. Frequent masturbation may be practised even by nonogenarians. Sleeplessness is a common accompaniment of senility, and the nocturnal insomnia is not affected in any way by the amount of sleep taken during the day. Depression, or senile melancholia, is a symptom of importance. The author emphasizes the fact that a senile melancholic is a potential suicide, and the most suicidal in this class is the merchant who develops the idea that he is ruined. Another mental disorder of old age is hallucination; hallucinations of smell appear to be most common. The author quotes instances of old men who constantly complain of the drains or of the cooking in their homes, and cites one or two instances where the hallucinations have been strong enough seriously to influence conduct. Hallucinations of sight are nearly as common.

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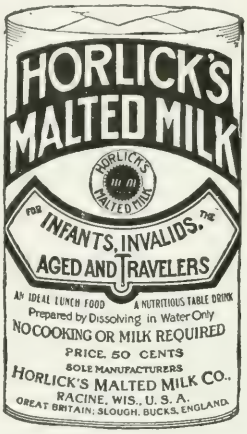

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The Diagnosis of Malaria.

G. Quarelli (*Il Morgagni*, Archivio, March 31st, 1920) reviews the literature and records the results of his observations on about 600 cases in which he had employed provocative injections. The drugs used were adrenalin 1 in 1,000 solution, strychnine 3 to 5 mg., 8 to 12 drops of a 1 per cent. alcoholic solution of nitroglycerin in 2 to 3 c.cm. of distilled water (given intramuscularly), emetine hydrochloride (intravenously or intramuscularly), arsenobenzol 0.8 to 0.10 gram (intravenously). The most effective means of producing an attack were nitroglycerin, in which positive results were obtained in 72 to 74 per cent. of cases; emetine hydrochloride, which gave positive results in 58 to 59 per cent., and strychnine, which gave positive results in 58 per cent.

The Sham Feeding Test in Diseases of the Stomach.

Dupuy (*Paris méd.*, April 3rd, 1920) states that the test of sham feeding introduced by P. Carnot in 1904 is the practical application of Pavlov's well-known experiments. After preliminary catheterization of the stomach before breakfast to determine if there is any stasis (in which case the stomach is completely emptied), the patient is given an appetizing meal of ten minutes' duration, which he is told to masticate slowly without swallowing, the food and saliva being spat out (after mastication). He is then left for ten minutes and is told not to swallow but to spit out any saliva secreted. At the end of that time the catheter is again passed. In normal cases 60 to 90 c.cm. of clear fluid, without any food particles, is withdrawn. The free hydrochloric acid varies from 1.64 to 1.80, and the total acid from 1.80 to 1.96 per cent. In 8 cases of cancer of the stomach Dupuy found that the total acidity was below 1 in seven cases, and that there was an absence of free hydrochloric acid in seven cases also. The peptic power always remained below normal, and the coagulation of milk was retarded. The quantity of gastric juice secreted after sham feeding was usually increased in cases of prepyloric or pyloric ulcer, and there was always an excess of hydrochloric acid even after recovery. The total acidity was parallel with the amount of free hydrochloric acid. In duodenal ulcer the secretion was usually increased. In dyspepsia following gall stones there was an excess of secretion and of hydrochloric acid. In nervous dyspepsia the character of the secretion varied, being normal, exaggerated, or defective in amount and acidity. In tabes the secretion was often entirely absent. In alcoholism hyperchlorhydria was usually present in the early stage, but later the amount of hydrochloric acid diminished, falling in extreme cases as low as 0.365. In tuberculous patients was anorexia the quantity of gastric juice withdrawn after sham feeding was normal; the fermentation activity was more diminished than was its acid content.

Staphylococcal Meningitis Treated by Intrathecal Injections of Colloidal Tin.

Rocaz (*Gaz. hebd. des Sci. méd. de Bordeaux*, May 9th, 1920) recounts a case of meningitis in a boy of 8 in whom lumbar puncture gave a fluid which showed pelymorphonuclear leucocytosis, and from which *Staphylococcus aureus* was isolated; he rapidly became worse in spite of repeated lumbar punctures and intrathecal injections of antimeningococcic serum and of 5 c.cm. of collargol. After four intrathecal injections of 1 c.cm. of colloidal tin there was striking improvement, and he was discharged in a fortnight.

Rheumatoid Arthritis Treated by Autogenous Vaccine Prepared from the Endometrium.

Robertson (*Edin. Med. Journ.*, May, 1920) records the case of a woman who had had rheumatoid arthritis for two and a half years. The existence of pathological symptoms of the urogenital organs was denied, but examination showed much creamy pus coming from the external os uteri. From a uterine swab was cultivated an anaërobic diphtheriod bacillus, vaccines of which (unlike those prepared from other sources) produced on subcutaneous injection a well marked reaction of pain. The rheumatoid condition was very greatly improved.

SURGERY.

Treatment of Compound Fractures: Standard Splints.

Orr (*Journ. of Orthopaedic Surg.*, April, 1920) emphasizes the points to be observed during the first ten days' treatment of compound fractures—namely, restoration of normal relationship of injured parts, and maintenance therein until healing occurs, the ultimate function being as carefully considered as final anatomical position; these points are said to be frequently disregarded in practice With the Thomas splint properly applied, femur and leg fractures can be immediately adjusted and can be efficiently immobolized afterwards. In fracture of the neck of the femur plaster-of-Paris applied by the Whitman method will maintain immobilization in a proper line for sufficient time; it is often of use also in open fractures of the upper arm and elbow, the elbow being flexed and the hand —except in a few cases in which future employment requires it to be placed palm downwards upon a table—supinated or dorsiflexed. Weights and pulleys are rarely used for traction only, but are often of value (in the Balkan frame) for arm and leg suspension or as an aid to the patient in lifting himself from the bed. Any degree of traction needed, whether for the femur or other bones, can be obtained by the proper use of the Thomas splint, and it is important that everyone should unite in using methods which have been found universally applicable rather than any particular one which depends for its success upon the personal skill of a few surgeons. Anyone can be taught to use the Thomas splint properly in its application to all kinds of cases, and it is urged that the four or five standard

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splints used throughout the American Expeditionary Force should gradually come into general use and that most of the other methods and apparatus should be discarded. Even individual modifications of these standard splints usually detract from rather than add to their utility.

A Peculiar Case of Foreign Body in the Throat.

D. J. De Levie (*Nederland, Tijdschr. v. Geneesk.*, May 1st, 1920), records the case of a man, aged 58, who, directly after eating a pear, had violent pain in the throat, vomited blood and had a choking attack. A skiagram of the lungs taken a few days later was negative. During the next three months he suffered from pain in swallowing and pain in the right occipital region and right ear. On examination by the writer the glands at the right angle of the jaw were enlarged, and there was tenderness to pressure at this spot. No signs of a foreign body could be seen in the mouth or throat, but the right pharyngo-epiglottic fold was swollen and tender. The symptoms, together with the history, suggested the diagnosis of a foreign body; this was confirmed by a skiagram, in which a needle was seen in the pharyngeal wall, its eye directed forwards and upwards. The following day, with the exception of 1 cm. which broke off, the needle was removed; subsequent recovery was uneventful. The needle had probably been accidentally driven into the pear by the saleswoman while polishing it with her sleeve.

Disease of the Orbit Originating in the Nasal Sinuses.

S. H. Mygind, (*Ugeskrift for Laeger*, March 4th and 11th, 1920) discusses in much detail the relation of orbital disease to inflammatory conditions of the nasal sinuses. He records 24 cases, in 8 of which there were endocranial complications, which proved fatal in 5 cases. Seven of the patients exhibited leptomeningitis, from which 3 recovered. Altogether there were 6 deaths—that is, a mortality of 24 per cent. This compares unfavourably with the combined mortality of 12.7 per cent. of similar cases published by other writers. The author suggests that this discrepancy is due to the tendency to publish successful rather than unsuccessful cases. With regard to indications for treatment, he considers great protrusion of the eye as alarming, especially if it has developed rapidly. Other signs indicating a serious condition and calling for operation are violent pain, general malaise, albuminuria, rigors, severe headaches, and vomiting. Severe œdema of the orbit and eyelids serious than rapidly progressive protrusion of the eye. The most slender evidence of endocranial complications warrants immediate operation; in the absence of the symptoms already referred to, operative treatment may be deferred, for as a r a day's delay throws the required light on the subject. A disease with a mortality of 24 per cent. justifies an operation even on suspicion. The only operation advocated by the author is free exposure of the orbit and the affected sinuses. The mere incision of the orbit to empty an abscess is inadequate.

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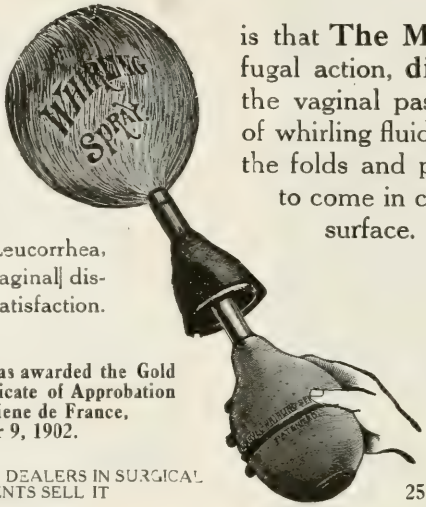

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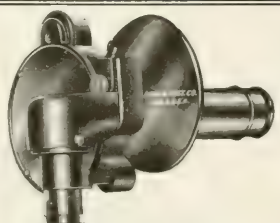

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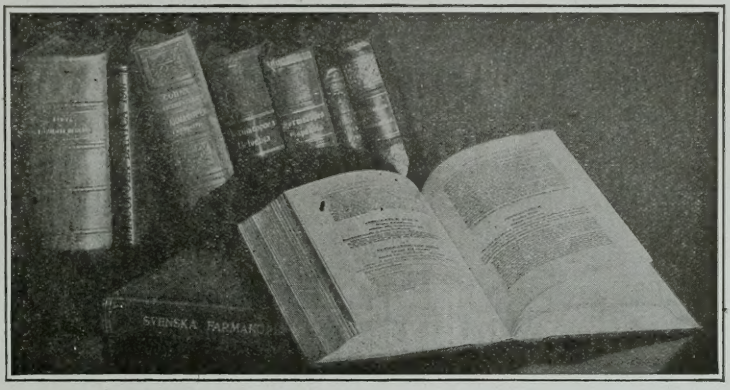

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